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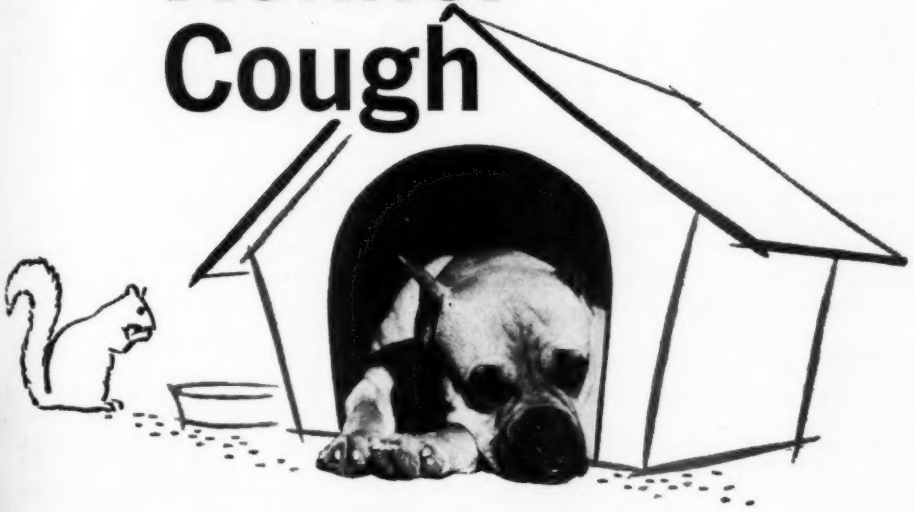

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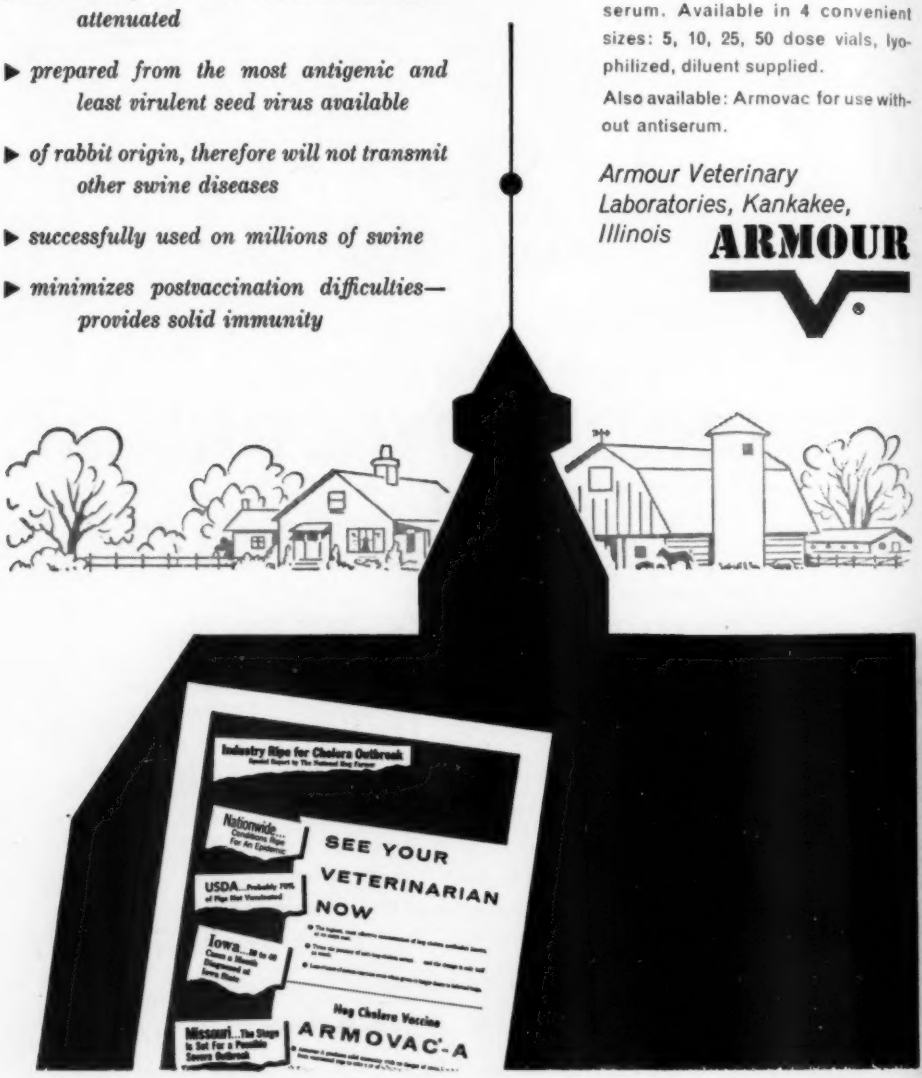

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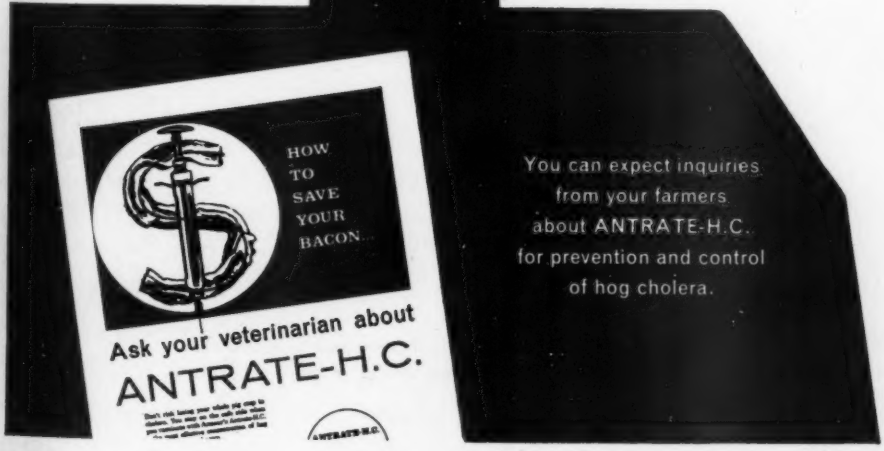
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The Meeting Circuit XXXV

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to treat bovine ketosis, canine dermatoses, inflammatory joint conditions with a duration of action that's "just right"

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(prednisolone trimethylacetate CIBA)

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Dairy Cow	Ketosis (acetonemia)	Single 100- to 200-mg. injection*
	Shock ("downer" cow) syndrome	Single 200-mg. injection as supportive therapy.
Dog	Dermatoses	5 mg./10 pounds body weight, total single dose not to exceed 20 mg. For sustained therapy, repeat once or twice a week as indicated.
	Inflammatory joint conditions	5 mg./10 pounds body weight, total single dose not to exceed 20 mg. Supportive oral therapy not necessary.

*This initial injection may be reduced to 50 to 100 mg. intramuscularly if simultaneous administration of intravenous glucose is given, thus permitting more economical glucocorticoid therapy. If necessary, either regimen may be augmented by an additional injection of 50 to 100 mg. Ultracortenol after 24 to 48 hours.

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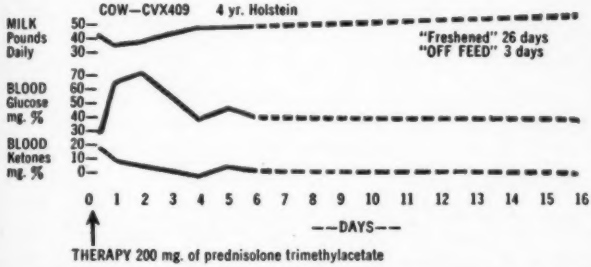
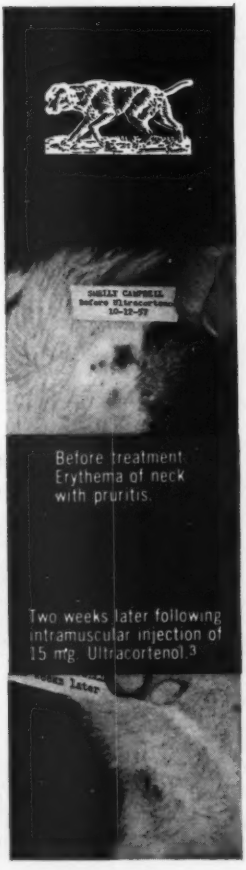
- appetite is restored, depression is dispelled within 12 to 24 hours[1]
- blood glucose levels are raised within 12 hours[1]
- blood ketone levels return to normal within 24 to 96 hours[1]
- a steady increase in milk production begins after 48 hours.[2]



This chart shows the good response in ketotic cow following intramuscular injection of 200 mg. of Ultracortenol.

(Adapted from Vigue[1])

CANINE DERMATOSES Reporting on 9 animals (of whom 6 received 15 or 20 mg. Ultracortenol in a **single** intramuscular dose), Pollock[3] says, ". . . Ultracorten Trimethylacetate [Ultracortenol] proved effective not only against the seemingly innocuous lesions, but also against the hemorrhagic dermatitis associated with exquisite pain." And, "The duration of the anti-inflammatory phase varies from seven to ten days depending upon the dosage. . . ."[3]



Before treatment. Erythema of neck with pruritis.

Two weeks later following intramuscular injection of 15 mg. Ultracortenol.[3]

References: 1. Vigue, R. F.: J.A.V.M.A. 133:326 (Sept. 15) 1958. 2. Shaw, J. C.: Personal communication. 3. Pollock, S.: To be published. 4. Rabin, P. H.: Personal communication. 5. Hoffer, S. H.: Personal communication. 6. Weir, H. T., and Hazelrig, J. W.: Personal communication. 7. Beck, J. W.: Personal communication. 8. Bull, W. S.: Personal communication. 9. Fessenden, P. E.: Personal communication. 10. Lohmeyer, C.: Personal communication.

SUPPLIED: Multiple-dose Vials, 10 ml., each ml. containing 10 mg. or 25 mg. of prednisolone trimethylacetate in suspension for injection.

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In a study supervised by veterinarians, cattle were shipped from a range in Oklahoma to a Colorado feed lot—an 18-hour truck trip. The veterinarians observed that not only were weight losses reduced by over fifty per cent in most cases, but the animals given SPARINE, 0.5 mg. per pound of body weight, were easier to handle; they went back on feed faster because they adjusted to their new surroundings without milling, fence walking, and bawling.

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*From range to feed lot.

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REFERENCES: 1. Vickers, C. L.: Personal communication. 2. Filion, R., and Trepanier, M.: Personal communication. 3. Lannek, N., and Brag, S.: Vet. Med. 49:75-78 (Feb.) 1954. 4. Felgate, C. A., and Swann, H. C.: Vet. Rec. 68:259-262 (May 5) 1956. 5. Guthrie, J. E.: Vet Med. 47:307-314 (Aug.) 1952. 6. Guthrie, J. E.: Personal communication.

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Florinef-S is indicated for otitis externa (running or abscessed ears); dermatitis (eczematoid, contact), anogenital pruritis, pustular folliculitis and related infections. Florinef-S reduces erythema and swelling, suppresses eruptions, subdues itching with 10 to 25 times the anti-inflammatory action of hydrocortisone; and combats secondary infection with both bacteriostatic and bactericidal action.

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Many persistent and recurring infections of the external ear and ear canal ("chronic ears") are often attributed to bacteria, or other agents, when in reality the etiologic organism is mycotic. Mycostatin is the only antibiotic specific against *Candida albicans* (monilia) — one of the principal causes of "chronic ears." Previously hard-to-treat dermatomycoses usually respond promptly and monial lesions usually improve 48 to 72 hours after therapy has been initiated.

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News Comment

Simpson-Keogh Bill Probably Will Pass

The 1959 version of the Jenkins-Keogh retirement income bill will probably be passed in the 86th Congress. Now known as the Simpson-Keogh bill (Representative Jenkins was not re-elected), the bill permits self-employed persons to establish tax-deferred retirement income funds. The bill breezed through the House in the 85th Congress, was sidetracked in the Senate.

A Medical Plan and the Simpson-Keogh Bill

The Academy of General Practice has a unique Physicians' Retirement Savings Plan which combines an insured retirement income annuity with a mutual funds investment program for Academy members. The new plan should be officially announced within 60 days.

Available for the first time to members of a national medical association, the plan will let individual participants decide how much they want credited toward an annuity as a hedge against inflation.

If Congress passes the Simpson-Keogh bill, plan participants could instruct that portions of each monthly payment be deposited in a separate fund and thus take advantage of tax deductions provided by the law. As written, the bill lets a self-employed person put up to $2,500 a year (for no more than 20 years) in a retirement income fund and defer income tax payments on these amounts until such time as the money is withdrawn as retirement income.

Virulent Hog Cholera Virus Bill

Support for a proposal to outlaw the use of virulent hog cholera virus came from the Iowa Swine Producers Association recently at its annual meeting. Cited as reasons for backing elimination of the virulent product from the market was a statement that it would make Iowa meat products acceptable in foreign trade. The action came as a result of proposals to outlaw virulent virus before the Iowa legislature.

Veterinarians Against Hog Cholera New Measure

Iowa veterinarians went on record recently in opposition to the outlawing of the use of virulent hog cholera virus. The Iowa Veterinary Medical Association said the stand in opposition to the proposals was taken at a meeting of the executive board.

"The modified live virus vaccines have not yet withstood a real hog cholera outbreak in the field," Dr. Robert Dappen, chairman of the legislative committee, said. "No large outbreak has occurred since their introduction in 1951 and 1952." Doctor Dappen said that serum reserves have been falling continually "and if we restrict the use of virus, these reserves will be depleted even more. Thus if hog cholera breaks in epizootic proportions, the hog industry will be the loser."

Since modified live virus vaccines have an affinity to embryonic tissue, there is no immediate way to vaccinate pregnant sows with modified live virus vaccine, Doctor Dappen said.

Discontinue Virulent Hog Cholera Vaccine

Production of all virulent hog cholera vaccine has been discontinued by Jensen-Salsbery Laboratories. The Kansas City firm is the first company to take this step. The company continues the sale of modified live virus hog cholera vaccine, SV-2. Company officials pointed out that since effective modified live virus hog cholera vaccines exist, virulent virus products are outmoded and it is only common sense to stop producing them. Sixteen states already outlaw use of virulent virus vaccines because of the contamination danger. Some 18% of the nation's hogs are still vaccinated by this method.

Agricultural Hall of Fame

The site of the proposed $5 million Agricultural Hall of Fame has been selected near Kansas City, Kansas and fund raising campaigns are well under way to finance the project. This national museum, located 11 miles west of Kansas City, Kansas on the new Kansas turnpike, will provide historical exhibits covering all phases of agriculture and is expected to be a major tourist attraction.

It seems logical that a section of this great agricultural showpiece should depict the historical development of veterinary medicine in this country. This phase of agricultural history has received little if any attention to date. Should any veterinarians or veterinary groups interested in veterinary history be in favor of such a project, a letter to Dr. A. W. Tenny, executive director, Agricultural Hall of Fame, City National Bank Building, 10th and Grand, Kansas City, Missouri, would receive attention.

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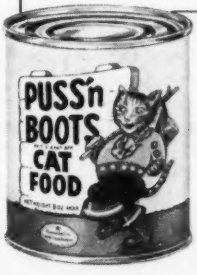

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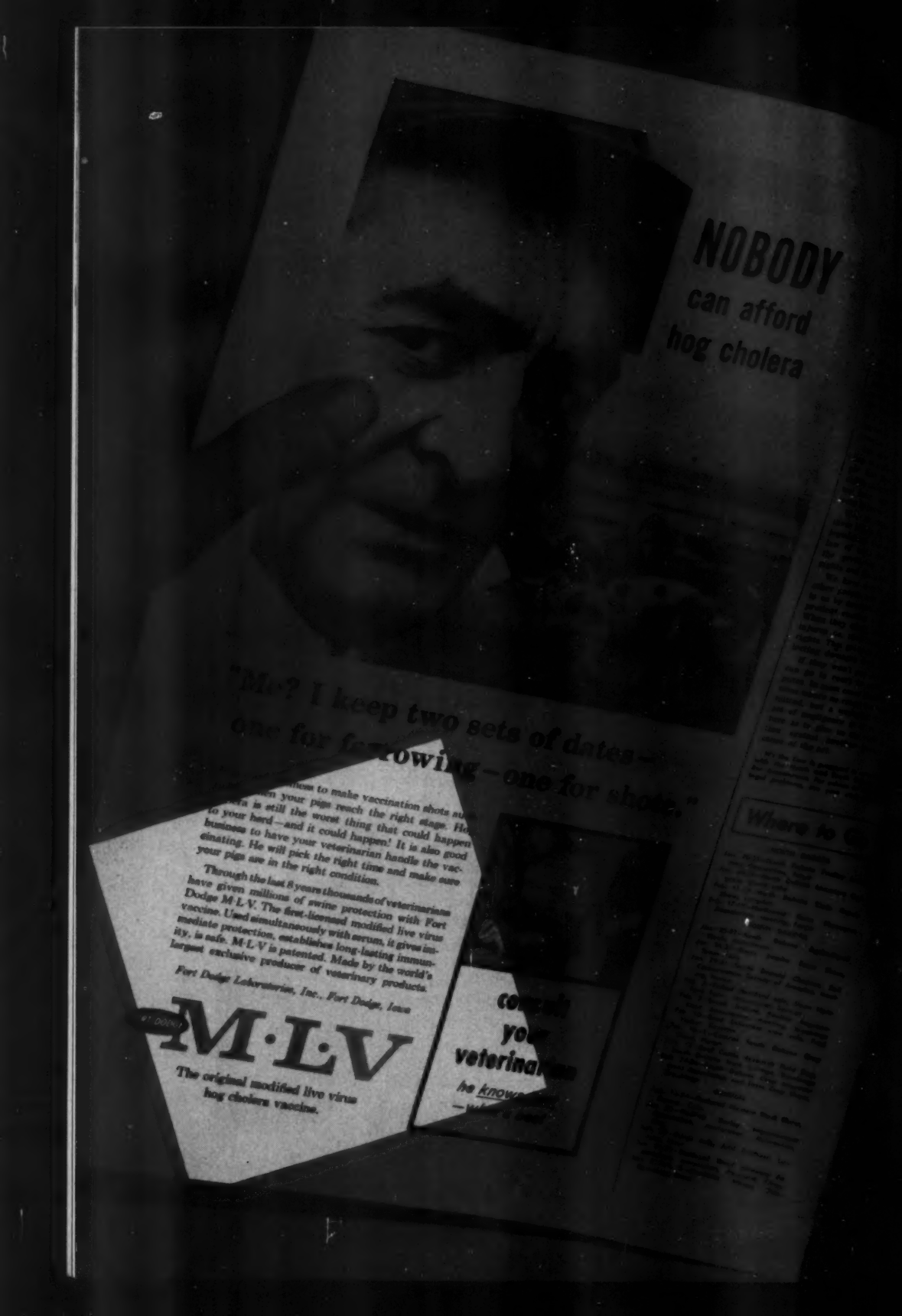
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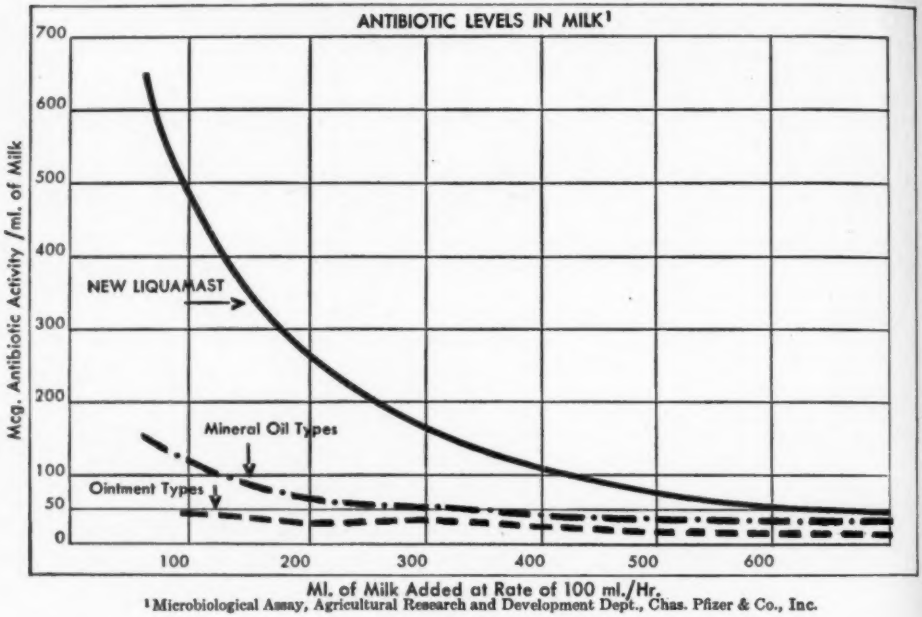

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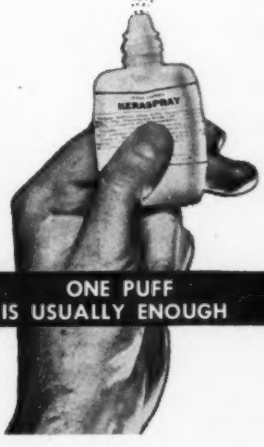

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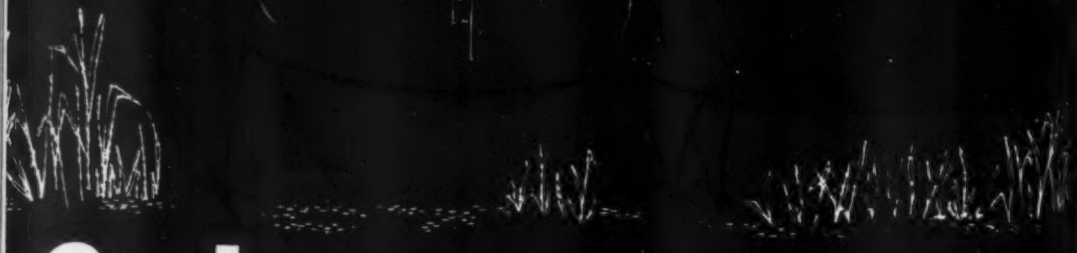


Swivax*

Examination of bulls for breeding soundness is an increasingly popular new veterinary service. Necessary procedures and equipment for this service are outlined. Veterinarians interested are urged to contact Dr. Harlan Hill, Colorado State University, for complete information on the subject as the value of animals involved does not allow experimentation. Inconsistent findings by veterinarians could hinder acceptance of professional service by cattlemen.

Fertility Testing of Bulls

JOHN B. HERRICK, D.V.M.

Iowa State College
Ames, Iowa

THERE EXISTS AN INCREASING DEMAND in the cattle industry for fertility evaluation of bulls. This has been particularly true of the ranch areas, but now involves all producers of seed stock, *i.e.*, the producers of purebred bulls. Veterinarians have ably coped with this request in many areas, whereas in other areas the service is not available.

Basically, the need of fertility evaluation of bulls has been brought about by the sale and use of bulls that are sterile or possess low fertility. This has resulted in affecting the net reproductive efficiency of the herd. The amount of knowledge available today relative to reproduction in the male does not give the veterinarian sufficient facts to accurately determine that a bull will be capable of settling healthy females. However, it is possible to determine in most instances that a bull is not capable of producing conception. Therefore, a veterinarian can more accurately determine whether or not a bull is not capable of causing conception than he can determine that the bull is fertile. This is important and should be known by the cattle producer.

Equipment Necessary

A veterinarian wanting to evaluate the fertility of bulls will need a microscope, artificial vagina and in most instances an electro-ejaculator. In most instances semen from dairy bulls can be collected with an artificial vagina without too much difficulty. Clipping preputial hairs and sponging the underline with an antiseptic is advisable if the bull is tractable. Teaser animals may be cows that are in heat, steers or other bulls. Bulls make the best teasers in that they offer spirit of competition. Seminal fluid rubbed on the tailhead of the teaser animals frequently stimulates the bull to mount. This has lead the writer to accumulate ac-

An electro-ejaculator is one of the most important pieces of equipment for fertility evaluation.

cessory fluid to use for such purposes after it has been sterilized to remove the possibility of disease spread.

The electro-ejaculator, a new innovation for checking bull fertility, is a valuable adjunct to the veterinarian's armamentarium. There are several on the market and many veterinarians have had their electrician friends "create" one for them.

Technic

Basically, the electrode is passed into the rectum beyond the anal sphincter and current is applied in a rhythymic action, gradually increasing the current. Electrical impulses at first cause the animal to strain or "hump up." As they are increased, erection takes place, plus the dripping of accessory fluid. Increased voltage then causes protrusion of the penis through the preputial orifice and opaque fluid, the sperm rich part of the ejaculate, is observed. An artificial vagina, funnel or cup clamped over the penis obtains sufficiently enough ejaculate for study.

The use of the ejaculator will cause extension of one of the rear legs and in some instances the bull will go down. No after effects are observed following the use of the electro-ejaculator. Not all bulls react the same to these electrical charges. Most bulls can be ejaculated in five minutes. However, proper preparation is important. Nervous, excitable bulls that are hard to manage may be poor candidates for the ejaculator. A restraint that closely confines the animal, such as the common portable chutes used by veterinarians, works very well.

Normally, a bull that is sexually excited prior to electro-ejaculation will yield an ejaculate with very little effort. Thus the use of a teaser animal, the presence of another bull, or accessory fluid aids in the collection of semen by this method. Bulls that fail to react favorably to the instrument are, if allowed to rest, more apt to ejaculate upon the second attempt.

Not all bulls react favorably. Frequently bulls fail to obtain an erection. Rearrangement of the electrode after cleansing the rectum and starting again with a mild stimulus will frequently yield good results. Ejaculation in the sheath is common, yet does not yield a satisfactory sample. Other bulls may yield only accessory fluid, yet when rested and tried again may yield a satisfactary ejaculate. Roughly, seven bulls out of ten will give a satisfactory response to the ejaculator. No adverse after effects have been noticed. The electrode can be easily held in the hand on full power, thus the bull is not in pain, but is greatly stimulated. Finger electrodes have not shown an advantage over the probe type of electrode.

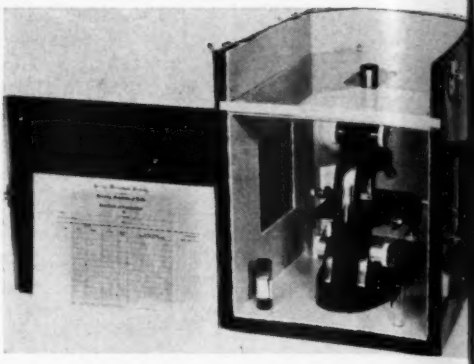


Fig. 2. Portable microscopic laboratory eliminates temperature effects during examination of semen.

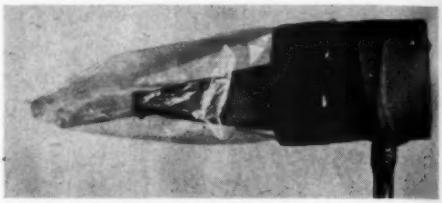


Fig. 3. Cone with plastic bag to hold warm water as protection against temperature changes during collection process.

If a great number of bulls are to be collected at a given spot, a small, wide-mouth thermos jug acts as an ideal receptacle for semen collection in that the warm jacket protects the collected sperm from shock. In many cases where only one bull is to be examined an artificial vagina is used. This is particularly true if the owner is to do the collecting, in that he can easily clamp the vagina over the protruded penis.

A portable microscope with a warm stage is set up in a suitable spot prior to collection. This can be done in the farm office, milk house or kitchen.

Semen Evaluation

There are several methods of evaluating semen. However, for routine fertility testing, ratings of *concentration*, 20 points; *degree of vigor*, 40 points; *morphology*, 30 points; and *percent of alive sperm*, 10 points, are easily made with a maximum of 100 points. A bull with a rate over 60 to 70 points is considered a safe breeding prospect.

Concentration is rated on color of semen and density of sperm. A photometer is used in commercial breeding establishments for this purpose. Degree of vigor is rated by observing the movement of the sperm, evaluating progressive movement of the individual sperms, or mass movement of the sperm mass under the microscopic field. Morphology is best determined by staining sperm with methylene blue, india ink, methylene orange, and alive-dead strains. Semen samples possessing over 30 to 35% abnormal sperm usually denote infertility. Clinicians may vary in their standards in semen evaluation; however, if they are consistent their evaluation will be acceptable. Bulls then can be classified as acceptable, average or unsatisfactory when a physical examination is used in conjunction with the semen examination.

Fees

Many veterinarians ask, "What fee should I charge?" In some areas where a practitioner will evaluate many bulls in a year's time such as in the ranch areas then the fee probably will not be the same as in areas where only an occasional bull is fertility checked. In most areas where a chute, microscope, ejaculator and services are lumped together, fertility checking fees may amount to $15. to $25. per bull. When more bulls are checked the fee may be much less.

Blackleg in a Deer

Kansas in general is a blackleg state and it is difficult to raise cattle in most parts without having them solidly immunized. In the last 39 years I have seen many cases of blackleg in cattle, and when an animal is down it is one of the first things to consider in differential diagnosis. Although there are many sheep in the state I have never seen a case of blackleg in sheep.

On June 25, 1958 I was called to our local Sunset Zoo to see a two year old Virginia or White Tailed deer in convulsions. The animal had given birth to a male fawn the day before and I assumed some parturition complication was involved. The doe was brought to our hospital and died a few minutes after arrival. A postmortem was immediately performed and all body organs appeared normal except the gluteal muscles of both legs, which were streaked with two wide areas of black muscle. It had a characteristic buttric acid odor and appeared as typical blackleg. Two guinea pigs injected died the next day and on culture a clostridium resembling Chauvi was identified.—*Edwin J. Frick, D.V.M., Department Surgery and Medicine, Manhattan, Kansas.*

Potentiating of Antibiotics

Reports from the University of Arkansas indicate that it may be possible to increase the effectiveness of antibiotics by use of "potentiating agents." Terephthalic acid seems to increase the absorption of the antibiotics from the intestinal tract into the blood stream.

Peterson (*Feedstuffs*, Sept. 27, p. 4) suggests that air sac disease can now be controlled with antibiotics in the feed—economically. Heretofore the cost of the extremely high levels of antibiotics needed in the feed was prohibitive. With the addition of terephthalic acid, the effectiveness of the antibiotic is increased and lower levels may be used.

What all this means to the practitioner is this. It may be possible to treat pigs as well as poultry with antibiotics fed in the feed. Using a potentiating agent like terephthalic acid, it may be possible to get much higher blood levels on lower oral doses of antibiotics. This technic may not only increase the effectiveness, but may also decrease the cost of treatment. The development will be watched carefully.

Panel

THIS PANEL DISCUSSION was presented at the 36th Annual Postgraduate Conference for Veterinarians held at Michigan State University, January 21-22.

The discussion was moderated by Dr. G. R. Moore, Department Surgery and Medicine, Michigan State University. Practitioner members of the panel were: Dr. M. C. Bigalow, Flushing, Michigan, Dr. C. H. Coy, Hillsdale, Michigan, Dr. W. Mackey, Lapeer, Michigan, Dr. L. P. Newlin, Romeo, Michigan.

DOCTOR MOORE: *This is perhaps the most common type of case encountered in practice. A three year old Holstein is presented. She had one calf six months ago. Parturition was completely normal and heat period had been regular and normal since. She has not conceived after three artificial inseminations and two natural services. On clinical examination no pathological lesions can be found. This cow's reproductive tract seems to be normal in every way. Gentlemen, why doesn't this cow conceive? Doctor Bigalow what are your thoughts?*

DOCTOR BIGALOW: There are probably several causes. We commonly think of late ovulation, early fetal death, low progesterone levels, hypertension, physiological influences.

DOCTOR NEWLIN: We commonly think of early fetal death. Wisconsin investigators have established that 90% of these cases have conceived. Death of the fetus is probably due to a low grade infection.

DOCTOR MACKEY: I would like to submit the minority report. When called to see these cases that are quite normal, I do not feel that a low grade infection is present if discharges appear to be clean. I believe late ovulation is a big problem.

DOCTOR MOORE: *Gentlemen how would you handle this case?*

DOCTOR NEWLIN: I like to recommend breeding and then check the next day for ovulation. At this time I infuse the uterus with a 250 mg. capsule of tetracycline in 250 cc. of Furacin.

DOCTOR COY: In our opinion, many of these cases suffer from a low grade infection and fetal reabsorption. If they should be in heat when we are called to examine these cases we like to infuse the uterus with 10 cc. of aqueous penicillin-streptomycin in a volume of Furacin to make 40 cc. If called between heat periods I induce heat and infuse the medication.

DOCTOR MOORE: *How do you make these infusions, Doctor Coy?*

on Bovine Infertility

DOCTOR COY: I use the plastic capillary tubes and a metal syringe.

DOCTOR MOORE: *Doctor Coy what do you think of Newlin's delayed infusion technic?*

DOCTOR COY: As long as it is an aqueous solution it probably makes little difference.

DOCTOR NEWLIN: It has been established that the sperm are pretty well gone in 15 minutes, returning to the uterine horns in three to four days. Infusions are gone rapidly. Not too many of these cases conceive at that service anyway but are ready for the next period.

DOCTOR MOORE: *Let's take a look at this second case. This herd is typical of Michigan's larger and better managed herds. For some time now occasional cows have come back in heat in 40 to 100 days after being bred and presumed to be pregnant. In this particular herd both natural service and artificial insemination are employed. Doctor Bigalow, what are some of the causes of these phenomena?*

DOCTOR BIGALOW: I think first of infectious causes such as vibriosis, hormonal problems caused by heavy lactation, retained corpus luteum or cystic ovaries.

DOCTOR NEWLIN: Some of these cases apparently lack sufficient progesterone.

DOCTOR MOORE: *I believe it is important to recognize the differences between cow no. 1 we have just discussed and this case. More important, what do you do when you get these cases Doctor Coy?*

DOCTOR COY: In cases such as number two, I like to check first the bull for any infections and then try changing the heat cycle.

DOCTOR NEWLIN: If 15 to 30% of the herd is involved, especially in an Angus herd, I am suspicious of trichomoniasis. We have many good herds infected in our area.

DOCTOR MACKEY: I like to check the bull, also the possibility of faulty artificial insemination technic.

DOCTOR MOORE: *Gentlemen let's take a look at some of these common individual cow problems. Doctor Mackey, how do you handle anestrus?*

DOCTOR MACKEY: We must start with a good examination. Make sure that she is not pregnant. It is always possible to have a short heat period that is not observed. A retained corpus luteum is always a possibility.

DOCTOR MOORE: *It is my experience that pregnancy is most common. Dr. Newlin how do you get rid of a retained corpus luteum?*

DOCTOR NEWLIN: I have probably killed four cows by expressing manually, and several others have come close. If I run into hemorrhage I tell the client. In spite of the potential hazard I still do it. I also tap some of these through the vagina.

DOCTOR COY: I find the medium firm ones that come out rather easily offer the greatest possibility of hemorrhage. I like to hold my thumb in a while after removal in an effort to prevent some of these cases of hemorrhage. On the difficult, hard to express cases I give an estrogen and see them again at a later time. The cystic watery ones are probably more difficult to get a clean removal but are generally less dangerous. I

always use stilbestrol in oil in such cases rather than the reposital form.

DOCTOR MOORE: *In removal of cystic corpus luteum sometimes the center ruptures. If you will carefully work out the pieces and administer estrogens these will usually regress. I always tell the owner in advance of the potential hazards of hemorrhage and alert him of the symptoms of anemia and uneasiness that he should observe in such cases. With a little warning one can always do a laparotomy and tie off the vessel.*

DOCTOR COY: Many cases of cystic corpus luteum are encountered at the peak of production. I like to administer calcium and Klot in these cases as a precautionary measure.

DOCTOR MOORE: *Let's discuss nymphomania for a moment.*

DOCTOR COY: Nymphomania is probably the toughest problem to achieve a permanent cure. Any time we have marked physical changes the prognosis must be guarded. You can express the cyst and quiet these cases. Gonadotropin, 2,500 units intravenously repeated will yield some recoveries. This can be followed with reposital progesterone.

DOCTOR MOORE: *Have any of the panel members encountered any untoward effects in administering gonadotropin intravenously?*

DOCTOR MACKEY: We are fully aware of the shock potential but have not encountered any acute shock cases, just reduced lactation occasionally.

DOCTOR NEWLIN: I dried a good producer up completely. I use doses much higher than those used by Doctor Coy in the range of 10,000 units intravenously. On cows treated repeatedly, I use reposital progesterone, 75 milligrams every 3rd day or two grams in one dose intramuscularly.

DOCTOR MOORE: *I routinely keep adrenalin available. In at least two cases I recall, it has prevented death. It would seem possible in these cases that surgical removal of the involved ovary might be the answer. But in our experience the other ovary becomes cystic a few days after surgery. Gentlemen, what about vaginitis?*

DOCTOR BIGALOW: I think some of these cases can be ignored. For instance, adolescent vaginitis in young heifers. The purulent suppurative discharges from granular vaginitis are important however and often a herd problem. One should check the bull for sanitation and always use drugs that are non irritating and long acting. I check for a tipped vulva in some of these individuals.

DOCTOR NEWLIN: I suture the vulva shut in some of these cases with a modified Lembert's suture.

DOCTOR MOORE: *Let's talk about cervicitis for a minute.*

DOCTOR NEWLIN: When I feel induration and thickening I like to use a scissors to cut off the fingers of induration and then swab with Lugol's solution. It is well to infuse the uterus with antibacterial agents first and avoid covering the vaginal walls with the irritant iodine solution.

DOCTOR MACKEY: I know that others do these operations with some success.

DOCTOR MOORE: *Here is an actual case for us to work on. A herd consisting of 35 Holstein milking cows and one eight-year-old bull. Two cows have been fresh for ten months. One bred eight times and one seven times. Eight cows had been bred five times. 15 other cows and heifers had been bred two to four times each. The remainder of the herd were either recently fresh or had been bred once or twice without further recurrence of estrus and were presumed to be pregnant. On clinical examination, herd management, nutrition, sanitation, were better than average. All animals appeared to be in a good state of physical health. Vaginal and cervical inspection revealed a few*

cases of moderately acute granular vaginitis, particularly in the heifers, and three cases of mild cervicitis. All cows but two exhibited normal ovaries and good uterine tone on rectal examination. Examination of breeding records revealed no heat cycles of abnormal duration. Examination of the bull semen collected in an artificial vagina gave the following findings: volume of ejaculate — 8 cc.; gross appearance — watery. Motility rating grade two, or very low.

DOCTOR MACKEY: The volume of the bull semen is excessive, watery and of low motility. I would dispose of the bull and turn to artificial insemination.

DOCTOR NEWLIN: What if this same situation occurred with artificial breeding? What is the diplomatic procedure one should follow?

DOCTOR MOORE: *Many of our better purebred herds request semen from specific bulls. Therefore, a single individual could still be involved. When one encounters such a problem it is always best to speak to the inseminator. Try to help him. Help him check the motility of the semen used, transportation methods and the records of this particular sire envolved. Let's discuss leptospirosis for a few moments. Doctor Coy, how do you diagnose leptospirosis?*

DOCTOR COY: We see quite a lot of leptospirosis in our area. We become suspicious when we see mastitis without inflammation or an edematous retained placenta. We pull blood samples in these cases and find many to be positive. We keep a file in our office on these samples just as we do for brucellosis. Leptospirosis can be a sterility problem. Vaccination has helped in some herds when accomplished on an annual basis.

DOCTOR MOORE: *Have you had the experience of samples being laboratory positive without observing clinical symptoms?*

DOCTOR MACKEY: Leptospirosis must be a localized problem. We seem to have little in our area, but in talking to other practitioners it seems that they encounter it quite frequently.

VETERINARIAN FROM THE FLOOR: If you have positive clinical symptoms and the blood tests check out negative, better check for other species of the Leptospira organisim.

DOCTOR MOORE: *We have had cases that showed no symptoms but there was laboratory evidence of spreading infection. Other investigators have detected other species of the leptospira in rats that could disturb the blood test. One needs clinical manifestation of the disease, not just the blood test results alone. How do we handle Leptospirosis?*

DOCTOR NEWLIN: If we have a cow with 106 degree temperature showing jaundice, coffee colored urine and flaccid udder, we vaccinate the herd immediately without blood testing.

DOCTOR COY: If suspicious we send 4 or 5 samples from suspect cows to the laboratory. If we get positive titers we vaccinate the entire herd.

Disease Free Pigs

Young, of the University of Minnesota, recently of the University of Nebraska, is still doing research on a unique plan to have pigs born sterilely — that is, free from extraneous and internal ailments of the sow by delivering the pigs by means of hysterectomy approximately two days before the termination of normal parturition. After their delivery the pigs are kept away from other swine. Some success is reported, and pigs so delivered have done well at least from the standpoint of nutrition. The general purpose of the plan is to restock farms with disease-free hogs.

Large Animal Practice in Wisconsin

IN REPUDIATION OF THE WAILS of a few pessimists within and outside the profession, the demand for large animal medical service is definitely growing. While it is certainly true that the day of the "shikles mechanic" and practice from the kitchen sink are gone, the editors of VETERINARY MEDICINE have yet to encounter a well managed partnership practice operating out of a good facility that has found the maximum potential for veterinary service in their area.

As George Montgomery and photographer Bob Taylor report to the readers of *Capper's Farmer*, an abstract of which appears in these lines, the pattern of growth for agriculture and veterinary medicine alike lies in quality and efficiency. While the number of potential clients will decrease, the veterinary service-conscious client doing a good job of increasing his farming efficiency offers an unlimited market for more and better professional service. It has always been easier to extend worthwhile service to good clients than to convince marginal operators of the need for disease control. This pattern will certainly continue along the lines reported in this typical well-run Wisconsin practice.

By scrubbing shoes with disinfectant, veterinarians preclude the possibility of carrying diseases to the next farm. The procedure is not only a good sanitary measure, but a public relations device as well.

Agricultural Demands

Modern farmers require the best in professional knowledge to guard the health of livestock. The amount they will spend for the services of veterinarians depends on hard economic facts, and faith in the veterinarian's ability to deliver economic results.

Dr. Richard F. Bristol and Dr. Dennis J. Carr are partners at Montfort, Wisconsin, a small farming community that offers, among other things, 800 farmer clients, almost all of them within an eight mile radius of their Montfort clinic. They have a client for every quarter section within that radius. During the last five years gross income for the partnership has increased at

Doctor Carr is shown here using the California mastitis test on a problem cow. The jellylike material in the cups, he tells the client, indicates mastitis in all four quarters.

least 16% annually, and is continuing to grow.

One farmer client summed up the reason why services are burgeoning for the Montfort Veterinary Clinic and its partner owners. He said:

"I'm making my 210 acre farm bigger by expanding in livestock and poultry. As the species and numbers of each increase, your problems multiply. I'd be sunk without good veterinary help.

"Let me give you some examples. I have 41 Holsteins of milking age, with 38 in production now. Last year they turned out an average of 11,820 pounds of milk, 431 pounds of fat a cow. But I'm not satisfied with that. I want to put better cows in the herd as fast as I can raise them.

"One of the cows I was counting on was Speck. She turned out 15,430 pounds of milk, 510 pounds of fat in her second lactation. Last winter she slumped badly. Her ears drooped. She looked sick.

"I called the clinic. Dr. Carr came out. He took a look at her, went out and brought in his metal finder. It works like the mine detectors they used in the war.

"He guessed it the first time. She had hardware trouble. Back out he went and brought in his surgical kit. He cleaned and sterilized the area high on her left flank, blocked off all nerves in the area, and operated on her standing up.

"When he had made an incision in the skin of the flank and in the rumen wall just beneath, he put on a sterile shoulder-length plastic glove, picked up a strong magnet from the kit, reached into the rumen and began moving the magnet around wherever metal might lodge. He came out with three short pieces of wire that had been cut up by the hay chopper.

"In less than a week Speck was giving more milk than she had produced on any day of the lactation before she was operated. She has been fresh seven months, and now has 12,720 pounds of milk and 442 of fat. That wouldn't sound bad as a 232-day record for a cow that hadn't had an operation during the lactation.

"You may think they have a big practice now. But just watch. You'll see farmers using them more than they ever did before. Just take this farm for one. I'm ready to let them outline a mastitis control program for the herd. I'll do whatever they tell me to. That's a disease you can't keep on top of without professional help."

Practice Reputation

Getting them promptly in an emergency is one of the things that keep the practice growing. When Drs. Bristol or Carr make an appointment for a certain time, they mean what they say — not 30 minutes or two hours later. And not ten minutes earlier, either.

A continuing, no give, no take battle with mastitis is one of the practice's most routine

An outside view of the new clinic at Montfort, Wisconsin. Doctor Carr is shown carrying supplies to his station wagon before a series of country calls.

Inside the new clinic, two secretaries take turns on duty. Among other things they record calls and relay them to veterinarians in the field.

problems. "Our biggest help to a man with mastitis is in showing him how to be sanitary, how to milk without letting the milking machine damage udder tissue," Doctor Bristol said.

"We find that hurry is the big ally of mastitis. Men try to use too many milking units. That hurries their work but it loses them cows. Cups are yanked off instead of being taken off carefully. The milker stays on too long and that damages the udder.

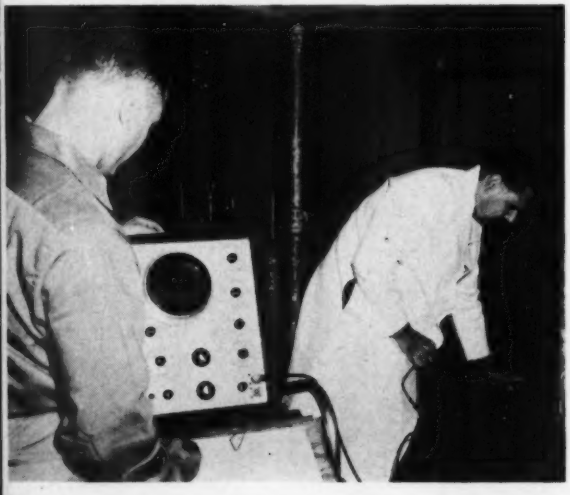
"A cow's udder won't take the severe licks it gets," Doctor Bristol told the farm press. "It contains delicate tissue, and the milking machine isn't the only thing that can damage it. One morning a call came asking us to come out to a farm where nine of the 20 cows were showing chronic mastitis. The flare-up came from bruising. The cows were dragging their udders over a high sill as they entered and left the barn."

Doctor Bristol gives good veterinary public relations a lot of credit for the increased use of veterinary services. When a report in the farm press, for instance, told farmers that metal can be removed from the rumen by a routine operation, dairymen began to want it done. Drs. Bristol and Carr have performed 110 such operations in 21 months.

Ultrasonic Device Measures Meat on the Hoof

An electronic device that can measure the size of a potential steak or chop in a live animal may prove highly beneficial in livestock marketing and breeding, USDA scientists report.

This device uses ultrasonics — high frequency sound waves — to determine the depth of back fat and depth and width of loin eye muscles in cattle and hogs. These measurements are particularly important in selecting meat animals that produce a high percentage of their weight in the more desirable cuts.



Dr. Richard L. Hiner, head of meat-quality studies for USDA's Agricultural Research Service at Beltsville, Maryland, says that ultrasonic waves go through tissue without harm to the animal. The time needed for these sound waves to pass through, bounce back from the interfaces or borderlines between fat, lean, and bone varies with distance or depth. The device uses these time differences to determine the depths of the various interfaces.

The nautical apparatus known as Sonar acts on the same principle to find objects in water. An electronic device similar to the one now being tested at Beltsville is used by manufacturing firms to find flaws or faults in metals.

Preliminary tests of the device are being conducted by A.R.S. animal husband-men and agricultural engineers. So far, comparisons of animals measured by ultrasonics before slaughter with actual measurements of the dressed carcasses show a high degree of accuracy for the experimental apparatus.

If continued tests prove the device's accuracy, it may be helpful in selecting and grading hogs and beef cattle before fattening or slaughter. It might be used by feeders to separate groups of animals into grades to insure proper finish for slaughter, and thus improve the uniformity of marketed livestock.

Technics described here are the subject of a feature article, Mastitis Can Be Licked Now, in the March 10 issue of HOARD'S DAIRYMAN. *These facts on strain gage amplifier studies of milking machines will help explain this new mastitis development to clients.*

Studies of Milking Machines

Examples of Pulsator Graphs Obtained with the Strain Gage Amplifier

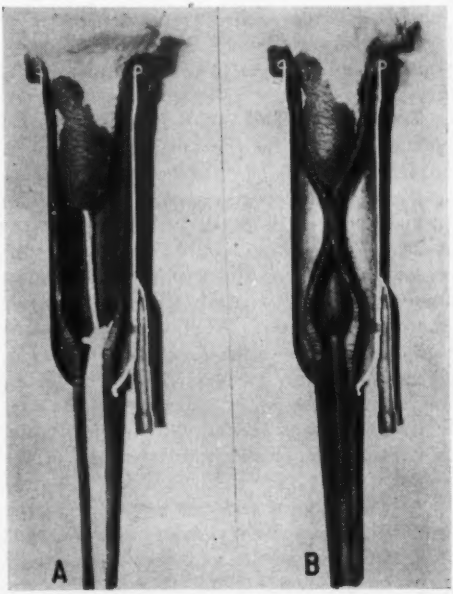
D. O. NOORLANDER, B.S. and O. W. SCHALM, D.V.M., Ph.D.

School of Veterinary Medicine
University of California
Davis, California

THE MAIN PURPOSE OF THE MILKING MACHINE PULSATOR is to protect the tissues of the teats from the effects of prolonged exposure to vacuum. Under vacuum, blood and tissue fluids move to the teat surfaces and into the tip of the teat producing congestion and cyanosis.

With the conventional milking machine, the pulsator vacuum in the outer chamber of the teat cup balances or exceeds the vacuum on the teat and this causes the rubber liner to open, permitting the milk to flow from the teat. The pulsator then directs air into the outer chamber, and this produces collapse of the liner against the teat, thus forcing the blood to circulate. The speed and force of liner collapse depend upon the level of vacuum on the teat, resilience of the rubber, and concentration of air molecules in the outer teat cup chamber, which is controlled by the pulsator.

The pulsator is the heart of the milking machine. It is of prime importance that it function efficiently and effectively if tissue stress is to be avoided. Pulsator action may



Model of milking machine teat cup in action: A—milking phase; B—Massaging phase.

be tested by attaching a vacuum gauge to the pulsator air hose. However, it requires considerable experience to detect all but extreme malfunctioning of a pulsator by this method. For this reason, the Strain Gauge amplifier was adapted for use in checking pulsator action of milking machines.[1] It is the purpose of this report to present a variety of tracings obtained with pulsators in use on commercial dairies and to make proper interpretations.

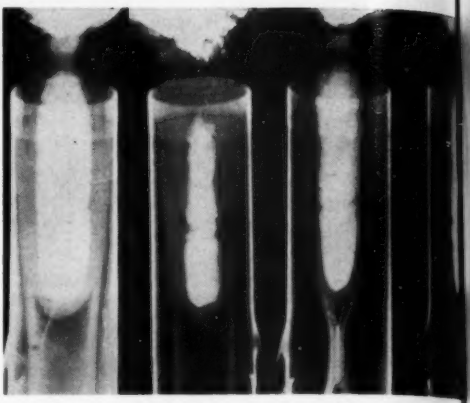
Interpretation of Pulsator Graphs

The graphs of pulsation cycles are recorded on plastic coated Perma-paper by means of a heated stylus. The paper is marked off horizontally and vertically into 1 mm. squares with heavier lines at 5 mm. intervals. (See graph.) The instrument is adjusted so that 15 in. of negative mercury pressure deflects the stylus downward 19 vertical mm.; with this adjustment, 1.26 mm. equals 1 in. of vacuum. The speed of the graph paper under the stylus is set at 25 horizontal mm. per second.

Pulsator readings presented in the figure have been identified by series as 1, 2, 3, and 4. Three separate graphs appear in each series and these will be referred to by position as L for left, C for center, and R for right.

Graphs 3L and 4R represent normal pulsator action for the particular machines tested and may be used for purpose of reference. Interpretation of the pulsator graph has been detailed,[1] but in brief, as the pulsator directs atmospheric air into the outer chamber of the teat cup, the stylus moves upward to reach 0 in. of negative mercury pressure. When the graph line fails to reach the level designated 0 in. Hg, it reflects failure to reach full atmospheric pressure in the outer chamber of the teat cup; this means inadequate liner collapse, resulting in congestion and cyanosis of the teats.

As the pulsator removes the air from the outer chamber, the stylus moves downward 1.26 mm. for each inch of negative mercury pressure produced. The elapsed time for each phase of liner action is expressed in 25ths of a second and is determined by the number of horizontal mm. utilized in recording the particular action.



X-ray of teat cup in action. Milk fills the teat cavity and buffers the impact of the collapsing rubber liner (a and b); end-point or machine milking when teat shrinks and pressure of collapsing liner on the tissues increases (a' and b'). Note greater compression of tip of teat in b' than in b.

Results

The Strain Gage amplifier has been used to test milking machines on a large number of California dairy farms. It has revealed an appalling situation with regard to the condition of pulsators. It has been estimated that up to 50% of pulsators checked have been found to malfunction either due to wear or accumulation of organic matter in moving parts or in air intake ports. Cleaning of dirty pulsators or replacement of worn or sluggish pulsators has been followed by improved udder health, increased production and reduced milking time.

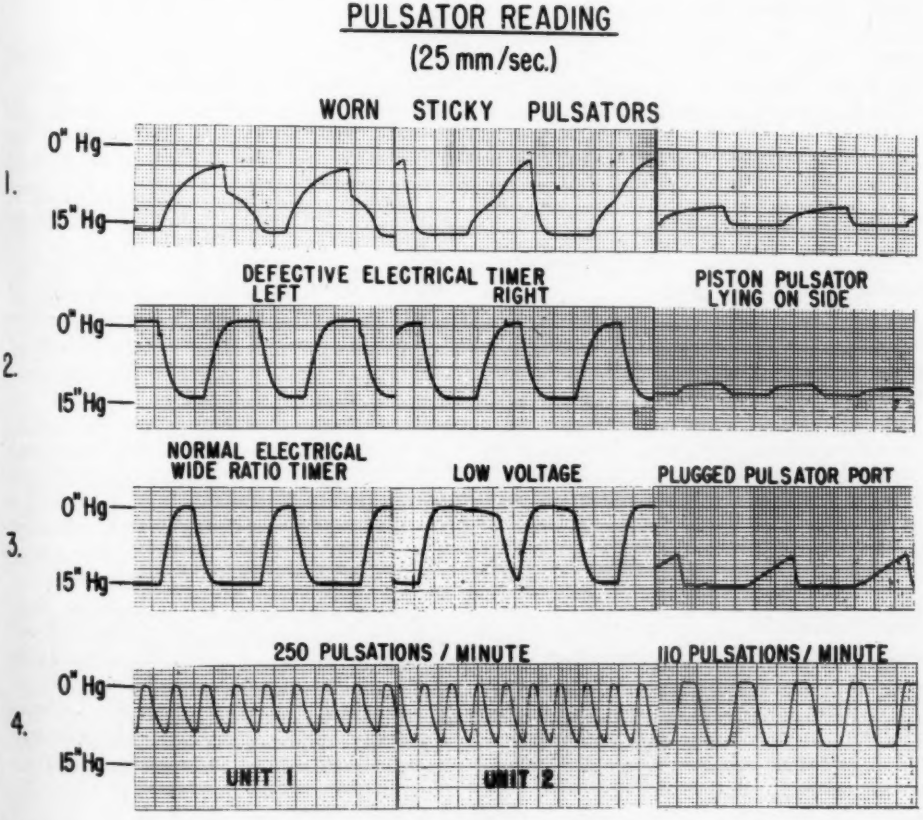
Graphs IL and IC are representative of a dual piston pulsator that has become worn due to abrasive action of foreign material entering the piston chamber. A dual pulsator milks two quarters while the opposite pair is in the resting or massaging phase. Wear of the piston chamber produces a different effect on the paired quarters. The atmospheric air required for complete liner collapse partially escapes into the vacuum system at the point of wear. The magnitude of this effect varies depending upon position of the piston in the piston chamber as air is alternated from one air outlet to

the other. Thus the malfunction is different on the paired quarters as revealed by a comparison of 1L and 1C. In both instances massage is incomplete, but the liner is partially closed over a greater period of time in 1L than 1C. Graph 1R depicts a completely non-functioning pulsator in which the liner is not closing and constant vacuum is applied to the teats.

Series 2 presents some common problems encountered with one system for controlled pulsation rate by an electrical timer. The Strain Gage amplifier revealed that a commonly used timer converter box was so designed that the dual pulsator produced different liner action on the paired teats. Generally, this type machine was milking paired teats from side to side rather than front to back. Compare 2L and 2C and notice that 2L has a long massage phase but short liner open phase while 2C has the reverse of this action. Under these conditions, one side of the udder is milking faster and in order to obtain complete milking of the opposite pair of teats, the faster milking side is exposed to prolonged action of the machine.

Graph 2R is representative of the same pulsator on a pipeline when it is allowed to pulsate while lying on its side. During milking, if the pulsator turns away from the vertical position, and this happens commonly, the piston movement becomes sluggish, particularly if the piston contains milk residue from a broken liner. In this case the liner fails to close at all. These apparent defects in design of new equipment, as revealed by the Strain Gage amplifier, have been called to the attention of the manufacturer.

Graph 3L is normal for a wide ratio electrical pulsator that milks all four teats



at a time. The milking phase is prolonged (67%) compared to the closed or massaging phase (33%). This wide 2:1 pulsator ratio milks faster than the common 50:50 ratio pulsators, but requires a somewhat faster pulsation rate (60 cycles per minute) compared to the recommended 48 — 50 per minute for the 50:50 ratio. Wide ratio pulsators should not be introduced into a herd without reduction in workload of the milker. If more machines per man are used than can be properly attended or if the milker has other duties while the machines are in operation, over-milking will result due to increased speed of milk removal and as a result, serious tissue stress will occur.

Graph 3C was produced by an electrically controlled pulsator that was receiving inadequate voltage for proper operation. In this case the electrician routed the 220 current through the motor before connecting it to the control box. This dropped the voltage to the pulsators to 6 volts, when it should have been 10-12 volts, resulting in sluggish, irregular action of the pulsator piston. This occurred in a 400-cow herd and within a period of one month after this milking system had been installed, 50 acute attacks of mastitis developed and 5 cases became gangrenous; in addition, the daily milk yield of the herd was reduced by 500 gallons. Following correction of the pulsators, the milk yield returned to near normal for this herd and the acute nature of the mastitis problem subsided.

Graph 3R depicts faulty pulsator action resulting from reduced air flow from a plugged air intake port. When the air intake ports become sealed, a serious malfunction results. In some makes of pulsators, plugged air intake ports cause the open-close time ratio of the liner to vary. In others, the liners will not collapse or open completely. This results in congestion and slow milking. In some suspension pipeline systems the movement of milk through the milk hose is facilitated by an air intake port in the pulsator. This port is small and may become occluded by milk residue. When this occurs, milk movement into the pipeline becomes sluggish and extreme vacuum fluctuation is produced at the teat end.

Series 4 consists of pulsation graphs produced with low-vacuum machines designed to be operated at about 110 pulsations per minute (4R) but which were being run at over two times the normal speed (4L and 4C). By inserting a thumb into the teat cup it could be ascertained that the liner was not closing completely with each pulsation cycle. The owner complained of reddened teats and of several cases of gangrenous mastitis. Graph 4R is more typical of this pulsator when operated at the speed recommended by the manufacturer.

Conclusion

The Strain Gage amplifier has been used to check milking machines on a considerable number of California dairy farms. The impression has been gained that at least one-half of all pulsators tested to date have shown signs of wear or malfunction due to accumulation of foreign material on moving parts or the plugging of air ports. Correction of the malfunction or replacement of worn pulsators has had a beneficial effect on udder health leading to reduction in gravity of the mastitis problem.

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Malaria Control

Male mosquitoes sterilized by irradiation with cobalt-60 and released to mate has proved effective experimentally in reducing numbers of malaria-carrying mosquitoes, USDA scientists report. Entomologists report about 80% control.

Use of this method was prompted by success enjoyed in Curacao and Florida by release of irradiated male screwworm flies. Laboratory research indicates that *Anopheles quadrimaculatus* mate but once, and therefore mating of sterile mosquitoes has been calculated to reduce the malaria carrier.

The absence of the veterinarian in poultry practice has allowed a vacuum to develop. Here the writer outlines concrete steps that must be taken if the poultry industry is to receive the same competent veterinary service other phases of the livestock industry now enjoy.

Developing a Poultry Practice

C. L. NELSON, D.V.M.

Jewell, Iowa

NUMEROUS REPORTS HAVE BEEN PUBLISHED pertaining to the veterinary practice and poultry disease control. These reports have been presented in the main with the hope of encouraging more practitioners to become interested in the diagnosis and treatment of poultry diseases. In addition, some states have conducted extensive short courses to aid the veterinarian in this field. These efforts have met with some success, and have been responsible for the elimination of many undesirable elements from the poultry industry. However, there is still a reluctance on the part of some veterinarians to enter poultry practice.

Perhaps an analysis of existing conditions in the poultry industry related to poultry disease control may help explain the adverse attitude of veterinarians to entering this field, and also be of some benefit in bringing about a solution to the undesirable conditions that now prevail.

Presented at the Midwest Veterinary Nutrition Conference, Kansas City, Missouri, December 8-9, 1958.

Poultry Medicine

It has been stated that no food producing industry has suffered more from quackery, high pressure salesmanship, and mis-diagnosis, than the poultry industry.[1] If this is true, then it is not too difficult to understand the problems encountered in trying to provide a worthwhile veterinary service to the poultryman. Veterinarians must ask themselves who is responsible for permitting such a condition to exist. Obviously this is not a healthy situation for the poultry industry economically. Is it because we have failed to provide adequate veterinary service for the poultrymen? Or is it because we have failed to bring about a workable relationship with other segments of this phase of agriculture?

In some instances, the abuse suffered by flocks at the hands of laymen is unbelievable. Promiscuous medication, mis-diagnosis, and incomplete understanding of disease processes by unskilled persons, undoubtedly cost the poultrymen millions of dollars annually. It is estimated that annually the poultry industry consumes a minimum of $45,000,000. worth of packaged drugs and biologicals at wholesale figures. This is six times more than the drugs and biologicals used in the small animal field, and equal to the total combined drug and biological consumption of the swine and cattle industries. In addition, millions of tons of feed containing antibiotics, coccidiostats, and other medicaments are used by the poultry industry.[8] It would be difficult to estimate the percentage of these drugs and biologicals actually necessary and needed to maintain the health of poultry flocks.

In addition to being confronted with high pressure remedy salesmen, quackery, and mis-diagnosis, the poultryman is now confronted, through the medium of farm journals, newspapers, radio, and television, with misleading advertisements promoting continuous use of drugs claimed to prevent numerous poultry diseases. Through these media, the poultryman is even urged to request the feed company to add medicaments to his feed for the prevention of diseases. In most instances, this has presented a problem to the feed industry. Usually, these medicaments are added under protest, and generally because of competitive reasons. Therapeutic agents do have a place in the control of poultry diseases. Too often, the flock owner is led to believe that a continuous medication program is essential to a healthy flock. Frequently, this type of program results in more cost to the owner than an actual encounter with the disease. The value of using preventive medicinal agents is determined by their merit and cost, in relation to the economic loss that may result from the disease itself. Who is going to determine for the flock owner the value of a continuous medication program, and the value of drugs used in the treatment of poultry diseases? Is it going to be a drug supply house who appears to be more interested in selling drugs to make a profit rather than on their merit? Or is it going to be someone skilled in the proper application of therapeutic agents? Such guidance by the veterinary profession would be of great benefit to the flock owner and the poultry industry as a whole.

With bird held with breast uppermost, needle is inserted through the V in a downward-backward direction for intracardial puncture and collection of blood sample. Professional technics such as these sell the veterinary profession.

Poultry Practice Problems

The problems encountered in developing a poultry practice will vary. In areas where there is no heavy poultry concentration, the poultry raiser is encouraged by various means of advertising to purchase proprietary remedies from feed stores, hatcheries, and drug stores. These remedies are advertised to promote growth, prevent egg slumps, prevent stress, and to treat a number of poultry diseases. The use of a remedy for the prevention of a disease or condition, can escape unchallenged for indefinite periods. This is where the bulk of proprietary remedies are used.

In areas where there is a heavy poultry concentration, the problem of developing a poultry practice presents other challenges. Generally, these areas are saturated with so-called merchandisers. These merchandisers are more active in areas where there is little competition from the veterinarian. It is not unusual to encounter "poultry experts" equipped with a "posting kit," dressed in a white coat, and even supplied with a microscope. The purpose is, of course, to impress the flock owner. Usually these so-called merchandisers or remedy salesmen are sponsored by companies known

in the field of veterinary proprietary remedies. They have been given a four or five day "short course" in poultry disease detection. Regardless of the competence of the instructors teaching these "short courses," it is beyond anyone's imagination to assume that in four days these "short course" students can become skilled in pathology, pharmacology, bacteriology, immunology, and other sciences that are necessary for proper poultry disease control.

Unpalatable Conditions

Regardless of the indignation that may arise, certain conditions are unpalatable but nevertheless exist. In some states, poultry practice has not been brought within the scope of veterinary practice acts. At the present time, it appears rather remote to obtain the necessary legislative action to prevent this pathetic encroachment on the poultry industry. Then there is the reluctance on the part of some veterinarians to accept the responsibility of poultry disease control. Is this because the poultry industry is infiltrated with undesirable competition? It has been demonstrated that the practitioner who will take the trouble to acquire competence in poultry practice has little to fear from the competition of the so-called "poultry expert."

If this is true, then it would appear that it is only necessary for the veterinarian to become interested in the diagnosis and treatment of poultry diseases and the result will be a lucrative poultry practice. It is not quite so simple. Many veterinarians have stated that they have equipped their offices with diagnostic aids and still were unable to do enough poultry practice to pay for their time and equipment. Consequently, the veterinary profession is not entirely at fault. Then how do we go about directing poultry disease control where it should be?

Probably no segment of the poultry industry is more interested in the welfare of the flock owner than the feed industry. Due to the amount of capital involved in many of the large poultry enterprises, various feed companies have found it necessary to finance the greater share of these large operations. As a result of the financial interests in these flocks, the health of the birds is important to the feed company and is a factor which determines the security of the investment in these enterprises. Consequently, the feed industry is interested in the health of all flocks under its feeding program. A healthy flock is essential to good weight gains and to a good feed conversion. These factors determine the profit for the poultryman.

Unfortunately, some of the feed companies are also guilty of being in the remedy business. This does not mean that they are in the poultry remedy business as a matter of choice. Perhaps the sale of these products has stemmed from the impression that veterinary service was not available in all areas. However, this does not mean that such practices are accepted or condoned by veterinarians who have an active poultry practice. Neither does it mean that feed companies in the poultry remedy business and other livestock remedies present a favorable impression on the veterinary profession. And certainly the stocking of remedies by feed companies in country elevators and hatcheries, to be peddled unscrupulously, closes the doors to any workable relationship that might be obtained with the veterinary profession. Such actions precipitate into such degrading thoughts as "you cut my throat and I'll cut yours."

There is no reason why a working agreement with feed companies can not be set up which would be mutually beneficial to both the veterinarian and the feed company. Primarily it takes a little "back porch" sweeping on both sides. The feed industry can be instrumental in helping to eliminate some of the undesirable elements that now exist in the poultry industry. To accomplish this, the following suggestions are offered for both the veterinarian and the feed industry.

Suggestions for Veterinarians

1. Equip your office with laboratory equipment to aid in the diagnosis of poultry diseases. Laboratory procedures are exacting and eliminate the guess work in diagnosing many poultry diseases. A number of articles have been written in veterinary journals describing this procedure in detail.[2,3]

2. Become acquainted with the feed rep-

resentative in your area and let him know of your interest in poultry work. He will undoubtedly welcome such acquaintance.

3. Familiarize yourself with management problems of poultry husbandry. Poor management is a contributing factor to a large percentage of poultry diseases.

4. Learn the nutritional requirements of poultry and become familiar with the feeding program of the feed companies in your area.

5. Never condemn a feed as the cause of a poultry ailment, or make a diagnosis of a deficiency disease without having a preponderance of evidence, and then first notify the feed representative. Deficiency diseases of poultry on a recommended feeding program are rare.

6. Charge a fee for your diagnosis and do not perform autopsies free of charge with the hope of making it up on medicable cases. A large percentage of autopsies will reveal individual conditions that require no flock medication.

7. Do not resent periodic calls by feed representatives to flocks that they have under feed contract. This is the only way that they can learn of the progress of the flock and make sure that the owner is following the recommended feeding program.

8. Do not medicate flocks unless there is a specific reason for doing so, and there is reasonable assurance that the results will be profitable to the owner.

9. Do not let flock owners in your area medicate their birds promiscuously.

10. Contact the feed representative before recommending the addition of medicaments to feeds. In large flocks requiring five to ten tons, this can be done more easily and economically at the home plant.

Suggestions For The Feed Industry

1. Contact the veterinarians in your areas to determine if they are interested in poultry disease control, and are willing to accept the responsibility of looking after the health of the flocks that you have on feed contract.

2. Provide the veterinarian with the necessary literature describing your feeding program and a description of the feeds used in the various growth phases.

3. Instruct your feed customers to submit birds to these veterinarians who are willing to accept the responsibility in the event of a disease outbreak.

4. Discourage your salesmen from attempting to make a diagnosis of diseases in a flock and selling medication. His time can be spent more profitably by selling feed.

5. Do not become involved in the remedy business.

6. If the occasion should arise whereby the feed has been blamed for certain conditions, consult the veterinarian who has made the diagnosis. Usually this is a result of a misunderstanding between the client and veterinarian.

7. Urge flock owners who are under a feed contract to refrain from buying expensive drugs from remedy salesmen for the periodic medication of their birds. This is an unnecessary expense.

8. Do not overpopulate individual farms with poultry. Flock owners have a tendency to do this unless restricted by some means.

Conclusion

If the poultry industry is going to receive the same competent veterinary service as other phases of the livestock industry, cooperation will have to be forthcoming from all interested segments. This is not a problem of the veterinary profession alone. A program directed at providing competent veterinary service to the poultry industry; a program to rid the industry of the undesirable elements that now exist; a program to control and eradicate poultry diseases, should appeal to all the industries that are an integral part of this vast enterprise. The non-support of such a program would imply that greed was preferred to the poultryman's welfare. The yardstick of success will be determined by the degree of cooperation of all the segments of the industry in supporting this venture.

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Practitioner's Laboratory

W. L. SIPPEL, V.M.D., Ph.D.

Florida Livestock Board
Kissimmee, Florida

Diagnosing Johne's Disease

Cows with chronic intermittent diarrhea and generally poor state of flesh are seen more or less frequently by practitioners doing cattle practice. One of the possibilities in these cases is Johne's disease.

Diagnosis is based on the skin test, symptoms, findings at necropsy, lesions and demonstration of the organism in feces, scrapings of intestinal mucosa or by histopathology.

The allergic skin test is more highly regarded in this country than abroad. A purified protein derivative of intradermic johnin, developed by USDA workers, appears to be an improvement over johnin or avian tuberculin, but is not generally available. These men found the cervical skin more sensitive than the caudal fold area for applying the test.

If presented with an animal with diarrhea and the other symptoms mentioned above, the practitioner can prepare a fecal smear by a method recently described by Cunningham and Gilmour[1] and examine it for acid-fast organisms.

Technic

1. Enough feces to cover 2 sq. cm. about 0.25 cm. deep is placed on a slide. If necessary, add water to the consistency of thick gruel.

2. Mix slightly without spreading and allow to stand five minutes.

3. A second slide is placed on its long edge at right angles to the first and the thoroughly mixed feces spread along the juncture of the two slides. (Fig. 1.)

4. Slide no. 2 is lifted cleanly, leaving a straight edge of fecal stained fluid which is allowed to dry. An oven at 50-70 C. (122-158 F.) or other gentle heating can be used to hurry the process.

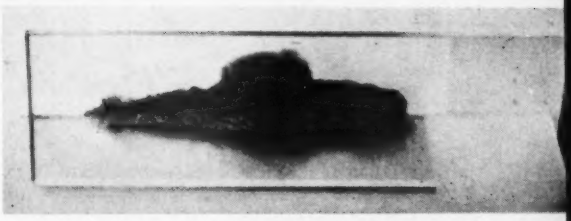


Fig. 1. Straight edge method of concentrating organisms to facilitate examination. Fecal material is spread along juncture of two slides held at right angles.

5. When dry, the excess feces is shaved off with a scalpel, being careful not to disturb the straight edge line. Small particles are then dusted off with a piece of gauze.

6. The preparation is stained by the Ziehl-Neelsen or Kinyoun's method.

The latter has the advantage of not requiring heat.

Kinyoun's Stain Technic

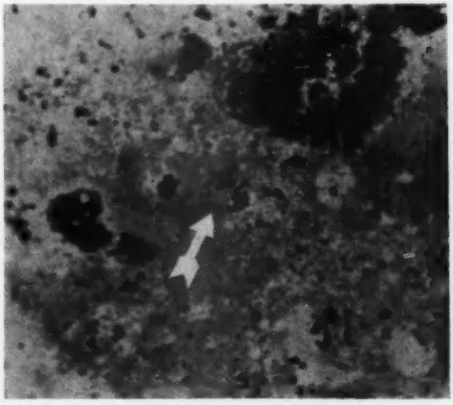
1. Flood slide with Kinyoun's stain for three minutes.

Kinyoun's stain: basic fuchsin, 4 gm.; phenol crystals, 8 gm.; alcohol (95%), 20 ml.; distilled water, 100 ml.

2. Wash with water and decolorize with acid alcohol (2% HCl in 95% alcohol) until no more color leaves the slide in the alcohol.

3. Wash in water, counterstain in 1%

Fig. 2. Arrow indicates small clump of Johne's disease organisms. Larger mass of organisms is seen in cytoplasm of cell at top right. These organisms stain red with Kinyoun's acid fast stain.



aqueous methylene blue for one minute, wash in water, dry and examine under oil immersion lens.

Acid-fast organisms, such as the Johne's bacillus, are red, others blue. Acid-fast organisms are found more easily, in greater numbers and with less debris, using the "straight edge" method. Cunningham and Gilmour[1] detected the organisms in feces from 100% of 17 naturally infected animals.

Scrapings of the rectal mucosa obtained ante-mortem will give positive results in 25-30% of advanced cases when stained by the above method.

If an opportunity for an autopsy is presented, the intestinal mucosa, in all directions from the ileocecal valve, should be examined carefully for thickening and corrugation. Smears of thickened mucosa stained with Kinyoun's stain will often reveal large numbers of acid-fast organisms occurring in clumps and singly. (Fig. 2.)

The mere presence of acid-fast organisms is not sufficient for a diagnosis, as bacteria with this staining characteristic are often found in normal cattle. The Johne's bacillus is smaller and thinner than saprophytic forms and tends to occur in clumps. Rankin[2] states, "Characteristic small acid-fast bacilli occurring in clumps of three to five or more is conclusive evidence of Johne's disease." Positive fecals should be confirmed by the skin test, bearing in mind that the reaction is most often unlike the tuberculin reaction in that a diffuse thickening of the skin, rather than a nodule, is obtained in positive cases.[3] The hair over the site of injection should be clipped and the thickness of the skin at the reaction site compared with that of the skin immediately above. Larsen[3] considers an increase of 2-3 mm. in the double fold of skin suspicious and 3mm. or more a reactor. Advanced cases may not react to the skin test.

If desired, positive intestinal mucosa scrapings can be confirmed by sending portions of thickened mucosa and the ileocecal lymph node to a diagnostic laboratory in 10% formaldehyde for histopathological examination. Examination of an acid-fast stained section should be requested.

Control methods (see article by Larsen[4]) in the United States are based on johnin testing and separating infected from non-infected cattle.

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Synthobiotic in Systemic Infections

A potent, wide-range germicide previously considered unusable except for topical application, has been successfully introduced into the blood of mice to combat infections which caused the death of 100% of untreated animals. Of treated animals, 60% survived.

This report was made before the New York City branch of the Society of American Bacteriologists by Dr. C. D. Dukes, of Baylor University, Houston.

The substance employed is an oil-like chemical called hexetidine, which has been developed by the Warner-Lambert Research Institute of Morris Plains, New Jersey. It has been proved effective against more than 100 disease-causing organisms, including both bacteria and fungi, but other researchers have been unable to get it into the blood stream in effective concentrations.

Doctor Dukes succeeded by "solubilizing" the drug in a detergent solution (Tween 80). Given by mouth, it was absorbed through the intestinal wall and thence into the tissues. The test mice were injected with fungi, *Candida albicans*, to produce monilial infections of varying severity. All mice in each experiment received the same infective dose, only part of them the drug.

In one experiment in which the infection killed 48% of the untreated animals, 66% of those treated survived.

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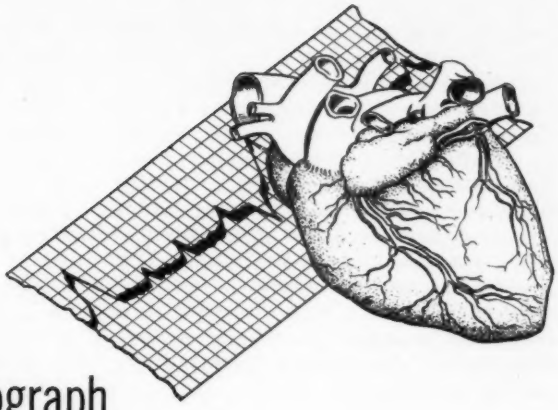
Clinical Applications of the Electrocardiograph



Although the electrocardiograph has not found general clinical acceptance in veterinary medicine, its future use depends on development of a body of knowledge. Applications of the electrocardiograph in veterinary practice reviewed here could expand the usefulness of this equipment in diagnosing infectious processes, electrolyte imbalance, kidney disfunction, as well as primary heart disease.

O. A. SOAVE, D.V.M.

Division of Laboratories
California State Department of Public Health
Berkeley, California

AN ELECTROCARDIOGRAPH is an instrument for measuring and recording extremely small voltage changes which occur in the heart during the process of depolarization and repolarization.

Although the electrocardiogram was developed and intended as an aid in the diagnosis of heart disease in man, this instrument has been used on a number of different species of animals and for many reasons. In the literature one finds information on the electrocardiogram of the mouse,[1] turtle and monkey,[2-3] cat,[4] and the dog.[5-10]

The primary consideration of interest here is the applicability of the electrocardiogram in veterinary medicine. This technic has not been applied to any great extent in the practice of veterinary medicine, with the exception perhaps of some of the clinics in veterinary colleges. Is it feasible and practical to apply this diagnostic tool to veterinary practice and, if so, of what significance are the findings in animals recorded on this machine?

It should be emphasized that the electrocardiogram is no panacea for the discovery of the etiologic agent in disease states. It is no substitute for careful physical examination nor for laboratory tests when indicated. It is an adjunct or aid in supporting suspicions or for presenting more evidence in favor of the clinical diagnosis. Many times the electrocardiograph will indicate an abnormal condition which exists in the heart prior to the appearance of symptoms. On the other hand a normal tracing does not mean that no cardiac disease exists.

It is acceptable to state in referring to electrocardiogram tracings that one is compatible with or suggestive of myocardial dis-

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ease; not that it proves or shows the existence of myocardial disease.

The electrocardiogram is a proved asset in the practice of human medicine and has demonstrated usefulness in canine medicine in indicating the possible presence of such cardiac aberrations as abnormal rhythm, conduction disturbances, myocardial lesions, traumatic conditions, and pericarditis.[8]

The electrocardiogram has been used in research on dogs for a number of years and work has been done with this machine in the fields of experimental medicine, surgery, microbiology, pharmacology, physiology and toxicology.

The Electrocardiogram of the Normal Dog

Electrocardiograms have been procured on normal dogs by many investigators and the average times and appearance of the various waves and complexes have been reported.[5-7,9-11]

Some of the technical aspects present in securing acceptable tracings are: position of the animal, use of anesthetics, and placement, type, and attachment of the electrodes.

Electrocardiograms of the dog are usually taken with the animal lying on its right side, strapped down lying on its back, or in a position of sternal recumbency. If the animal is under anesthesia, it is easier to place it on the right side; if not under anesthesia, strapped down in the supine position is best.

With dogs that are not tractable or those that refuse to lie still, anesthesia may be administered to insure absolute quiet and to facilitate handling the animal. Sodium pentobarbital or pentothal sodium may be used; neither drug appears to materially affect the electrocardiogram.[12] Tranquilizing drugs may also be used to good advantage and do not appear to affect the electrocardiogram.

In man, German silver plates are usually used to attach the machine to the body. This type of electrode may be used on dogs as well. It is preferable to use the type and size of plates used for infants on most dogs as these are smaller and fit the size of the dog's limbs better than the adult type. Electrical alligator clamps may be used as a type of attachment. These clamps have serrated teeth and a fold of the dog's skin may be inserted into the teeth to insure a firm connection. A third method is the use of needle electrodes. In this method the electrode consists of a needle similar to the ones used for inoculation. The needle is inserted under the skin and the protruding portion is attached to connecting wires of the machine.

The proper locations for the placement of the electrodes have been covered in the literature by several authors.[6-12] A summary is presented in table 1. It might be mentioned that occasionally some interference from hair or a poor connection will occur and, if possible, it will allow for better contact if the attachment area is shaved and electrode jelly applied to the area.

Normal values for the various waves of the electrocardiogram of the dog have been given by a number of workers. These findings are summarized in table 2. Some workers found a wide range of normal variation in the electrocardiogram of the dog with spontaneous changes occurring in serial electrocardiograms. They found day to day variations in the appearance of the various waves and complexes also.

The conduction system of the dog's heart is not as highly developed as that of man, which allows for more variation in the appearance of the waves and complexes. Conduction times in the dog for various waves are possibly of more importance in the detection of disease than the appearance of the waves and complexes.

Since variations of the electrocardiogram can occur from causes other than heart abnormalities, they can be misleading. Such things as panting, movement of the animal, muscle tremors, electrical interference, and variations due to breed and size may all present a misleading picture. These artifacts are usually easy to interpret once they have been seen.

Clinical Electrocardiography

Electrocardiogram changes have been described for a multitude of disorders of the human heart. Most of the abnormal pictures seen are not characteristic of, nor do they reveal the etiological cause of heart disease. They are only indicative of myo-

cardial damage, regardless of cause.

Infectious disease may, through a combination of factors, affect the heart with resultant electrocardiogram changes. Abnormal tracings have been reported for such virus diseases as poliomyelitis,[13-14] measles,[15] and Coxsackie virus infection.[16-17] Coxsackie, poliomyelitis, and influenza viruses may all cause a myocarditis with electrocardiogram changes.[18] In dogs, probably such virus infections as distemper and hepatitis may produce a myocarditis or pericarditis since these diseases can be of a pantropic nature.

Not only viruses but bacteria may also produce an adverse effect upon the heart. In a study using strains of streptococcus bacteria inoculated into dogs, 26 of 99 dogs developed an endocarditis from this inoculum.[19]

Eight cases of myocardial involvement were observed in a total of 80 human patients with leptospirosis (*L. icterohemorrhagica*). All eight produced electrocardiogram changes involving T waves.[20]

Electrocardiogram changes occurred in 14 cases of tetanus. The predominant changes were a sinus tachycardia, prolonged QT times, ST elevation and P wave alteration. Undoubtedly the powerful toxin elaborated by this organism influences the reaction of the heart muscle.[21]

In a report covering one patient with a positive histoplasmin skin test, electrocardiogram changes involving inversion of the T waves and indicative of a pericarditis were seen.[22] Pericarditis may also occur accompanying tuberculosis.

Electrocardiograph Report

Some of the transient effects on the heart observed with the electrocardiograph during infections might be attributed to the febrile reaction produced by the invading organisms. It has been found that heat (41-42 C. = 105-106 F.) for two to three hours produces a shortening of the QT interval and more highly positive and peaked T waves in dogs. It is believed that these changes are due to the heat itself and not because of alteration in the chemical composition of the blood.[23] Possibly the elevated basal metabolic rate associated with fever is sufficient to cause electrocardiogram changes.

In infectious diseases the electrocardiogram is of value in determining first, if the heart is involved, and secondly, whether this involvement is transitory or of a more permanent and damaging nature. Frequently the suspicion that the heart is involved is not present unless an electrocardiogram is taken during the course of an infectious disease.

In diseases affecting the kidneys with a resultant electrolyte imbalance, the electrocardiogram will demonstrate the effects of changes in the serum electrolyte levels graphically.

In nephritis and nephrosis, and especially in uremia, the serum electrolyte balance is altered due to abnormal filtration by the glomeruli or impaired function of the tubules. Electrocardiogram changes seen are usually produced by a potassemia (hyperkalemia) and consist of a depression of the heart beat (bradycardia), and an increase in the QT time.[9,24-25]

In prolonged vomiting and diarrhea such as enteritis, intestinal obstruction, or intussusception, the serum electrolyte balance is disturbed due to a loss of chlorides and a resultant loss of potassium. With hypopotassemia, or low potassium, cardiac effects are the reverse of those seen with potassium retention; an increase in the heart rate and a shortening of the QT time. In more severe cases ventricular changes appear in the form of a widening of the QRS complex and a widening of the T wave.[26-27] A retention of potassium is consistent with an acidosis and a depletion of potassium with an alkalosis.[28] Because certain electrolytes are essential for inception and control of the heart beat, it is to be expected that any change in their normal concentration will produce an adverse effect on the heart.

Severe anemias may influence the electrocardiogram, probably through changes in the acid base balance of the serum. Essentially the changes seen affect the T wave with minor inversions observed.[12]

Surgery may also produce changes in the electrocardiogram. Cahue checked 66 patients with the electrocardiogram postoperatively after chest surgery and found that 20 of these individuals developed

changes in the heart rhythm and that 27 showed evidence of pericarditis. The cause of the abnormalities was suggested as being the age of the patients, hypoxemia, vagal stimulation in chest and stomach surgery, and pericarditis.[29]

In a study on dogs that developed post-operative pericarditis, it was found that changes in the R-ST junction (displacements) due to post operative pericarditis did not reach their maximum development until two days after surgery.[30]

In chest and gastric surgery and in repair of diaphragmatic hernia, it is entirely possible that cardiac disturbances might occur because of manipulation of the vagus nerve. Because of the severity of this type of surgery, heart damage may occur due to anoxia, anesthesia or shock.

In cases involving trauma both to the head and chest, electrocardiogram changes occur. In chest trauma without evidence of external injury, the heart may be severely damaged and alter the electrocardiogram producing a lowered ST takeoff, slight inversion, and low QRS voltage.[19,31]

Age and the aging processes may produce effects on the myocardium that will show up on the electrocardiogram. Gelfand found normal electrocardiograms in only one third of persons examined over 80 years of age. Changes seen were occasional premature beats, right bundle branch block and T changes. The normal physiologic aging of the myocardium may produce some T wave changes.[32] The electrocardiogram of the aged may present some minor changes of the PR or QRS or the height of the T wave and changes in the rate and rhythm. About one fourth of aged hearts (over 60) show evidence of myocardial damage.[33] It is possible that the effects of latent or inapparent infection may contribute to heart-disease and produce some myocarditis with resultant fibrosis, thereby rendering the heart more susceptible to disease in later life.

Sympathomimetic Drugs

Sympathomimetic drugs such as epinephrine, norepinephrine, and metaraminol which stimulate the sympathetic nervous system, may produce ventricular extrasystoles and ventricular tachycardia in normal dogs.[34]

Digitalis produces an increase in the length of the PR wave, atrioventricular dissociation, QRS widening, QT shortening, and ST depression and T inversion.[35] It is becoming a more common practice today to use the electrocardiogram to adjust digitalis dosage in man. Digitalis changes the order of repolarization and its effects on conductivity, rate, and rhythm are unpredictable.

Arecoline or acetyl choline may cause a shift in the pacemaker of the heart from the sino-auricular node to the atrio-ventricular node.

TABLE 1. Various Leads Employed with the Electrocardiograph

Leads	Area of Electrode Attachment	
	positive electrode	negative electrode
A. Standard Limb Leads.		
I	left forearm	right forearm
II	left leg	right forearm
III	left leg	left forearm
B. Multiple Precordial Leads.		
CF 1 to CF 6	six various positions over the heart.	left leg
C. Vector Leads.		
VF	left leg	right, left arm and left leg.
VL	left forearm	as above
VR	right forearm	as above
V 1 to V 6	six various positions over the heart.	as above
D. Augmented Vector Leads.		
AVF	left leg	right, left forearm
AVL	left forearm	right forearm, left leg
AVR	right forearm	left forearm, left leg

Arrhythmias

The most common disorder of the heart beat seen in the dog is sinus arrhythmia. This occurs commonly enough to be considered a normal beat disturbance in the dog. In sinus arrhythmia the distance from one P wave to the next waxes and wanes, or increases and decreases.

Sino-auricular block is occasionally seen in dogs. This occurs as a result of an organic lesion within or surrounding the sino-auricular node and produces an interference with the transmission of impulses leaving this node.

Atrio-ventricular block may occur and may be incomplete or complete. In this disorder some organic interference has occurred in the conduction tissue of the atrio-ventricular node or the bundle of His and has interrupted or interferred with transmission of the impulse from the node to the ventricles.

Abnormal beats such as premature beats, ectopic beats and extra-systoles are occasionally registered on the electrocardiogram. These indicate, in general, an escape of the impulse from the sino-auricular or atrio-ventricular nodes either prematurely or at a time other than usually noted. These abnormal beats sometimes occur in pairs or in groups of three, and the phenomena is referred to as bigeminy or trigeminy.

Premature beats may occur in normal dogs without any heart involvement but they are more common in animals with heart disease. Infectious disease which may produce some degree of inflammation at or near the seats of impulse conduction of the heart can produce premature beats.

Congenital Defects

Congenital defects of the heart have not been reported upon at length for the dog. Undoubtedly such things as pulmonary stenosis, septal defects, and coarctation of the aorta occur in dogs. Probably the most common congenital defect of the circulatory system seen in dogs, usually puppies, is patent ductus arteriosis. With congenital defects a normal electrocardiogram will frequently be seen.

Interpretation of the Electrocardiogram

What the various waves and complexes of the electrogram represent should be considered first in order that deviations in these might be understood.

The P wave represents the depolarization wave of the auricular musculature. This wave travels from the sino-auricular node to the atrio-ventricular node. The PR interval is the time required to depolarize the atrial musculature plus the delay which occurs in the transmission of the impulse through the atrio-ventricular node to the beginning of ventricular depolarization. The QRS complex represents the complete depolarization of the ventricular musculature. The ST segment, which is the time from the end of the QRS complex to the beginning of the T wave, represents the depolarized state, or the interval of time between depolarization and the beginning of repolarization. The QT interval is the entire time required for depolarization and repolarization of the ventricular musculature, and the T wave represents ventricular repolarization.[3a]

Because the appearance of the waves and complexes of the electrocardiogram of the dog have a tendency to vary in the normal animal, it might be of greater clinical significance to attach most importance on changes in conduction time of the various intervals. For example, if the P wave in-

Table 2. Electrocardiogram Intervals and Time

Investigator	PR Interval	QRS Interval	QT Interval	Heart Rate
Peterson (5)	0.08-0.12	0.04-0.06	0.14-0.19	90-138
Horowitz (6)	0.10-0.15	0.04-0.08	0.16-0.28	72-162
Lannek (10)	0.09[1]	0.03-0.045[1]	0.16-0.18[1]	—
Armistead (8) (Lead II)	0.07-0.12	0.02-0.07	0.12-0.23	—
Lombard and Witham (7)	0.08-0.15	0.04-0.06	0.20-0.38[2]	62-158
Soave (9)	0.08-0.10	0.03-0.06	0.16-0.21	80-160

[1]Approximately.
[2]QTc = The QT interval has been corrected for body size and heart rate.

creases in time or is above the normal limits, it indicates some interference with auricular contraction; or, if the time for the completion of the QRS complex is longer than normal, some interference with ventricular depolarization.

As the Purkinje fibers of the conduction system of the heart travel throughout the heart musculature, disease or injury to any portion of the conduction system will be reflected in the electrocardiogram. The portion of the electrocardiogram affected will depend upon where the diseased tissue is located in the heart.

In general, disease of the auricular musculature will affect the P wave, abnormalities of the atrio-ventricular node or bundle of His will be reflected in the PR interval, and changes in the duration of the QRS and QT times indicate disease of the ventricles. In human cardiology the analysis of the waves and complexes is much more refined and finite; actual locations of diseased musculature being pinpointed by a careful study of tracings, such as, anterolateral myocardial infarction or apical myocardial infarction. A great deal of this information is obtained through a study of the electrical axis of the QRS complex, the presence, absence, or change in Q and S waves, and other small but significant changes in the electrocardiogram.

The value of serial electrocardiograms on a single animal should be mentioned. The significance of the electrocardiogram is greatly enhanced if it is possible to follow an animal with a series of tracings taken at specific intervals . In this instance more emphasis may be placed upon changes in the appearance of the various waves and complexes. As an example, if a dog has presented several tracings with a positive T wave, and later this becomes negative, it is a good indication that some degree of myocardial damage has occurred, especially if this should be in lead I or II.

Before it will be possible to attach clinical importance to changes in the electrocardiogram of the dog due to disease, it will be necessary to prove the significance of these changes. This must be done through frequent use of the electrocardiogram coupled with autopsy proof of the clinical findings.

Conclusion

The electrocardiogram is a diagnostic tool which has not been used extensively in veterinary medicine. Until a body of knowledge concerning the significance of the electrocardiogram in the dog is developed, it is not possible to place the proper significance on this method of measuring heart defects. Not only must the electrocardiogram of the dog be studied in detail, but the findings must be correlated with gross and histopathological studies in order to prove the significance of observed changes.

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A. A. H. A. to Meet in Colorado Springs

The American Animal Hospital Association will hold its 26th Annual Meeting at Colorado Springs, May 6-9, 1959. General sessions will be held at the new City Auditorium and various association functions will be at both the Broadmoor and Antlers hotels.

Preconvention workshops and seminars will be held at the Broadmoor Hotel on Wednesday morning, May 6, and the opening session of the convention will be called by President William G. Magrane, Mishawaka, Indiana, on Thursday morning, May 7.

Doctor Harlen E. Jensen, LaJolla, California, program chairman, has planned a full two and one-half day program of rostrum and television presentations. Once again Pitman-Moore Company and Radio Corporation of America will sponsor the television portion of the program.

Co-chairmen of Local Arrangements, Drs. Homer B. Brown and Rodney C. Walker of Colorado Springs, suggest that veterinarians plan on bringing their families and spend at least a week in Colorado in connection with the meeting.

Programs will be available about April 1 and may be had by writing to the office of the American Animal Hospital Association, 5335 Touhy Ave., Skokie, Illinois.

The Broadmoor Hotel at Colorado Springs with Spencer Penrose Stadium and the Ice Palace in the background. The resort hotel is only five miles from downtown.

CLINICAL REPORT

Functional Diarrhea in the Dog

FRANK BLOOM, D.V.M.

Flushing, New York

DIARRHEA IS ONE OF THE MOST COMMON PROBLEMS in small animal practice. Although multiple causes and lesions may be present, it is generally not recognized that a diarrhea of a functional type frequently occurs in the dog. This functional diarrhea is generally chronic, usually with absence of pathological lesions, and apparently is due to psychogenic factors. Animals exhibiting such chronic diarrhea are problem cases, and generally do not show permanent improvement following the use of antiseptics, antibiotics, opiates, or the usual antidiarrheal treatment. Changes in the diet are also not curative and produce little if any improvement in most cases.

This report is concerned only with functional diarrhea, namely, symptoms, diagnosis, and treatment.

Case Reports

A total of 24 dogs were referred to the writer by veterinarians who had been unable to make a diagnosis and offer therapy of permanent curative type. Table 1 records breed, age, sex, duration of diarrhea, the type of diarrhea, the presence or absence of blood in the feces, the frequency of the diarrhea, and whether or not vomiting existed.

Breed Incidence. Most affected animals were purebred, with predominance of Cocker Spaniels. Although Kerry Blues, German Shepherds, and Poodles, in addition to other breeds, were affected, incidence was not great enough to give definitive statistical data.

Sex Incidence. Exactly twice as many males were affected as females. However, the significance of this sex frequency can only be evaluated when larger numbers of cases are studied.

Age Incidence. No specific age incidence was observed. Diarrhea occurred in animals from one to 11 years of age.

Duration, Type, and Frequency of Diarrhea. In cases studied, the duration of the diarrhea ranged from two months to 8½ years, with an average of 33.4 months. The type of diarrhea was mucoid or seromucoid in most instances, whereas a serous diarrhea was less frequent. Blood was either absent, rare, occasional, frequent, or continual when diarrhea was present. The amount of blood varied from slight to copious, and was often the most important sign observed by the owner. Frequency of the diarrhea ranged from intermittent to persistent, although frequently no sharp division existed. With persistent diarrhea, practically all bowel movements were fluid or soft, whereas with intermittent diarrhea, stools were well-formed at times, but generally liquid. In half the animals vomiting was absent, although in the others vomiting was either rare, occasional, or frequent. Generally, vomiting occurred coincidentally with the diarrhea; however, in some instances no such relationship existed.

Physical Examination. Despite the duration, type, and frequency of the diarrhea, most animals were in relatively good physical condition. Others were thin, inactive, and exhibited poor hair coat and pale mucous membranes.

Previous Treatment. With several exceptions, most animals had been treated by one or more veterinarians. A variety of diagnoses had been made, including enteritis, colitis, liver disease, kidney disease, pancreatic disease, intestinal parasites, in-

testinal infection, coccidiosis, and others, and an equally large number of treatments had been prescribed. The latter included antibiotics, sulfonamides, opiates, intestinal antiseptics, antispasmodic drugs, anticholinergic agents, and other measures usually employed in the treatment of diarrhea. Numerous diets had been prescribed. All treatments, whether dietary or medicinal, were usually of little if any permanent value. In all instances therapy was either temporary or of no benefit.

Laboratory Studies. In a number of cases comprehensive laboratory tests of many types had been performed, usually without specific conclusions. In others, such studies were either not accomplished or were of limited scope. Regardless of previous laboratory examinations, all animals were subjected to the following studies: (1) complete urine analysis, including urobilinogen determination; (2) blood count, including total red cells, total white cells, hemoglobin determination, and differential count; (3) blood chemical studies, including urea nitrogen, uric acid, and glucose; (4) fecal ex-

TABLE 1. Data of Diarrhea in 24 Dogs

Dog	Duration of Diarrhea	Type of Diarrhea	Presence of Blood	Frequency of Diarrhea	Vomiting
Cocker, fem., 10 yr.	6 yr.	Seromucoid	Frequent	Intermittent	Absent
Cocker, fem., 1½ yr.	1 yr.	Mucoid	Continual	Persistent	Absent
Fox Terrier, fem. 10 yr.	6 yr.	Mucoid	Continual	Persistent	Frequent
Kerry, male, 3 yr.	4 mo.	Seromucoid	Absent	Intermittent	Absent
Cocker, male, 10 yr.	2 mo.	Seromucoid	Frequent	Persistent	Frequent
Min. Pinscher, male, 12 yr.	7 yr.	Mucoid	Rare	Intermittent	Frequent
Poodle, male, 7 yr.	2 yr.	Serous	Absent	Persistent	Absent
Afghan, male, 3 yr.	1 yr.	Seromucoid	Occasional	Persistent	Absent
Pomeranian, male, 8 yr.	1 yr.	Mucoid	Absent	Persistent	Absent
Irish Setter, fem. 5 yr.	4 yr.	Seromucoid	Occasional	Persistent	Absent
Beagle, fem. 6 yr.	2 yr.	Mucoid	Continual	Intermittent	Absent
Germ. Shep., male, 1 yr.	5 mo.	Seromucoid	Absent	Intermittent	Absent
Kerry, male, 2 yr.	3 mo.	Serous	Absent	Intermittent	Occasional
Poodle, male, 5 yr.	3½ yr.	Mucoid	Rare	Persistent	Absent
Terrier cross, fem., 3 yr.	2½ yr.	Seromucoid	Absent	Intermittent	Absent
Cocker, male, 4 yr.	8 mo.	Mucoid	Frequent	Intermittent	Rare
Cocker, male, 7 yr.	5 yr.	Seromucoid	Occasional	Persistent	Absent
Boxer, fem., 6 yr.	2 yr.	Mucoid	Continual	Persistent	Occasional
Germ. Shep., male, 9 yr.	4 yr.	Serous	Occasional	Persistent	Rare
Cocker, male, 4½ yr.	9 mo.	Mucoid	Rare	Intermittent	Absent
W. H. Fox Terrier, male, 11 yr.	7 yr.	Seromucoid	Occasional	Intermittent	Frequent
Shep. Cross, fem., 3½ yr.	1½ yr.	Mucoid	Continual	Intermittent	Occasional
Dalmatian, male, 2 yr.	3 mo.	Serous	Occasional	Persistent	Frequent
Cocker, fem., 9 yr.	8½ yr.	Seromucoid	Occasional	Intermittent	Absent

amination for parasites and protozoa, and for the determination of creatorrhea, amylorrhea, and steatorrhea; (5) *x*-ray studies, both with and without contrast media, were performed in some animals; (6) fecal cultures and fecal antibiotic sensitivity tests were done in some animals.

Results of Laboratory Studies. Generally, the composite of the laboratory studies was inconclusive as to the determination of an exact etiologic factor or factors. Urine analysis revealed no constant or specific abnormalities. Hematological examinations indicated a slight to moderate anemia in most of the dogs, which can be explained by the poor nutrition, loss of proteins in the stool, and the presence of blood. The blood chemical constituents examined were consistently in the normal range. Fecal studies revealed that parasites and protozoa were absent. Although some animals showed poorly digested muscle fibers in their feces, this was not due to pancreatic insufficiency but was the result of rapid passage of food through the intestines. Radiographic examination indicated the absence of foreign bodies. Barium administered orally revealed accelerated passage of barium through the gastrointestinal tract in most of the animals examined. Barium enemas indicated spasticity of the colon in most instances. Fecal cultures revealed a variety of organisms, but these were not constant or specific. Antibiotic sensitivity tests had been used previously to direct antibiotic therapy, but with consistent poor results. It is believed that in the present series the organisms present in the intestinal tract must be considered as secondary infections.

Present Treatment and its Results. The routine dietary treatment prescribed for all animals was the exclusive feeding of a canned therapeutic diet, (Rx Enterodiet — Atlas Canine Products). This diet is bland, non-irritating, low in fat and residue, and easily digestible. It consists of farina wheat, frozen whole egg, marrow bone broth, dextrose, cottage cheese, horsemeat, corn starch, brewer's yeast, trace minerals, and vitamins. The guaranteed analysis is protein, minimum 10%; fat, minimum 1%; crude fiber, maximum 0.5%; salt, maximum 0.2%; calcium, minimum 0.2%; phosphorus, minimum 0.2%; nitrogen free extract, minimum 20%; ash, maximum 1%; and dry matter, minimum 33%. This diet was fed in the ratio of from 3 to 5 oz. per each 5 lb. of body weight. Emphasis was placed on the fact that table scraps, scavenging, and other foods were absolutely contraindicated. With few exceptions this was the only treatment prescribed since there was almost immediate cessation of the diarrhea. In several animals it was necessary to administer anticholinergic agents (Banthine, 25 to 50 mg. every 6 hours), tincture of opium (2 to 6 drops every 2 hours), or colloidal kaolin (1 to 2 drams every 2 hours) at the start of treatment. With control of the diarrhea, which usually occurred within several days, these medicinal agents were discontinued. In some cases the owners would discontinue feeding Enterodiet, which was immediately followed by the return of the diarrhea. They quickly found that it was essential to feed Enterodiet indefinitely to permanently control the diarrhea. This therapeutic diet has been fed from two months to more than two years in the present series. During these intervals all animals have been in excellent physical condition, active, alert, and with lustrous hair coats.

Discussion

Diarrhea may be defined as a condition characterized by abnormal frequency and looseness of fecal discharges. As such, diarrhea is not primarily a disease but is a symptom resulting from a variety of causes within or outside of the gastrointestinal tract.

Generally, diarrhea may be infectious or noninfectious, fermentative or putrefactive, mild or severe, functional or organic, acute or chronic, intermittent, continuous, or recurrent, and mucoid, watery, bloody, or mucopurulent. Etiologically, diarrhea may be caused by protozoon infections, bacterial infections, intestinal worms, glandular dysfunction, mechanical factors, vitamin deficiencies, allergic factors, poisonings, psychogenic factors, fungi, and a number of miscellaneous causes. Because of the numerous etiologic factors, diarrhea presents a perplexing problem in diagnosis. It is therefore essential, by means of appropriate laboratory tests, to eliminate the possibility that any of the preceding causes are present before making a diagnosis of functional diarrhea.

In human medicine diarrhea of functional type has been described under the headings of unstable colon, irritable colon, mucous colitis, spastic colitis, or simple colitis, and psychogenic factors have been implicated as the cause. Similar designations have been applied to the condition in the dog, and it is not unlikely that psychogenic factors are likewise of etiologic significance. Certainly, in many of the dog cases the animals are of nervous, excitable temperaments. The mechanism of the functional diarrhea may arise from the abnormally numerous stimuli resulting from the emotional state affecting the gastrointestinal tract. The abundant network of afferent and efferent visceral nerve fibers of the stomach and intestines are the passageway for such stimuli, which cause smooth muscle spasm, contraction, and hypermotility of the entire intestinal tract. The colon alone may be the receptor of these emotional stimuli or both the small and large intestines may be affected. With hyperactivity of the small bowel, the rapid emptying permits the passage of partially and incompletely digested food to enter the colon, thus causing mechanical irritation and diarrhea.

Generally, diarrhea of functional type is not associated with any pathological lesions, either in the intestinal tract or elsewhere. However, in time, especially with inadequate control of the diarrhea, structural changes may occur. These changes arise secondarily on the basis of complicating intestinal infection, which develops because of the vascular spasm, diminished blood supply, and irritation of the mucous membrane by undigested food residue.

One of the outstanding features of functional diarrhea is its chronic nature. Since it is difficult or impossible to treat the animal on the basis of etiological factors, recourse must be taken to symptomatic treatment. Antibiotics, sulfonamides, opiates, anticholinergic agents, antidiarrheal agents, and dietary changes have all been found to be ineffective or only partially efficient. An effective treatment is feeding Enterodiet, a canned therapeutic diet, which usually controls diarrhea without any supplementary treatment.

High Calorie Mink Diets

Boosted calorie content of rations for mink can result in quality pelts at reduced cost, according to feeding specialist, W. L. Leoschke and C. A. Elvehjem.

Lard or cooked pork lungs in place of horsemeat in regular mink rations results in good-sized mink, excellent pelts, and slightly lower feed consumption.

The experimental rations were compared with a control diet of 40% horsemeat, 30% ocean whiting, 10% liver, and 20% mink cereal mix. Levels of 4% and 6% added fat in place of the same amount of horsemeat in this ration worked well; 8% added fat was too much.

In another experiment, the researchers substituted cooked pork lung for half the horsemeat in the regular diet. Results were the same — improved pelts at lower cost. A commercial mixture made from pork and beef byproducts has been reported to be a good substitute for horsemeat.

Antagonism of Antibiotics

Since tetracyclines may antagonize the action of penicillin, the question sometimes arises as to whether it is inadvisable to give systemic penicillin at the same time as local tetracycline therapy.

Antagonism between penicillin and tetracyclines exists, but depends on the concentrations of the two antibiotics. Penicillin is bactericidal and acts only on multiplying bacteria, whereas tetracyclines are bacteriostatic; but penicillin does not interfere with the action of a tetracycline when the concentration of the latter is in excess of that necessary for independent effect. When both drugs are used at near minimal effective levels, there is a possibility that interference between the tetracycline and penicillin might occur; the risk is overcome by using both drugs at their therapeutically effective levels either systemically or topically.—*The Pennant, October 1958.*

Electric Trim for Cats and Birds in Zoo Practice

L. E. FISHER, D.V.M.
Berwyn, Illinois

The handy electric tool has replaced the Resco nail trimmer and rib cutter for cutting claws and beaks of captive wild zoo specimens.

Rib cutter tends to splinter big cat's claws, thus creating unsatisfactory results.

Handee tool gives clean efficient trim when used on big cat claws.

LEFT

The Handee tool technic is equally efficient in dealing with beaks of zoo specimens.

BELOW

With proper restraint, Handee tool effects prompt and efficient trim of a big cat claw.

Evidence is presented showing that the opacity of the canine lens (cataract) may be cleared to a therapeutically significant extent. In these experiments intramuscular injections of an experimental material, identified as extract 1, cleared canine cataracts in an average of two to four months.

Therapeutic Improvement of Canine Cataract

A. C. IVY, Ph.D., M.D., GEORGE E. PARK, M.S., M.D., and W. C. DOLOWY, M.S., D.V.M.

Department of Clinical Science and Animal Hospital and Department of Ophthalmology
University of Illinois and Northwestern University
Chicago, Illinois

THIS ARTICLE REPORTS changes which occurred in the cataractous lenses of 27 dogs following administration of a protein-free extract of horse serum. The hypotheses for these studies are based on embryological development,[15-17] existing knowledge derived from tissue culture,[18-23] mechanisms of the normal and abnormal repair of wounds,[10-12,14,24,25] mechanisms involved in inflammation and its repair, and changes in capillary permeability.[26,27] Special or unique chemical substances exist in and about the cells of the body, and may be released on appropriate stimulation or injury.

These substances may be viewed as local "hormones" or autacoids, some of which act only locally and others of which are absorbed into the blood. When produced in large quantities, it is likely that they all enter the blood stream. It is now well established that these substances are concerned in the regulation of growth (stimulating and inhibiting growth), in the regulation of the movement of cells, in the control of the permeability of cells and basement membranes, and in the stimulation of the production of intercellular ground substance and its polymerization and depolymerization.[9,28] These substances also cause leukocytosis, leukopenia, fever, malaise, and necrosis of cells.

On the basis of such information, it was thought that it might be possible to obtain the agent or agents which act to control the permeability of cells and basement membranes, and which are concerned in regulating the growth of cells and the regeneration of normal structure in the process of the repair of an injury.

There are several ways one might undertake to produce and obtain, in pure form, these desirable substances. First, one could produce a large subcutaneous abscess in an animal with a chemical irritant like turpentine or with an electric cautery, or a foreign body like cellophane. Second, one could produce an abscess with bacteria. Third, it should be possible to obtain these desirable substances from the blood serum after a generalized stimulation of the cells of the reticuloendothelial system, or of those cells whose special function is concerned with body defense and repair processes. However, it was highly desirable that the beneficial and non-toxic substances be obtained free from those toxic substances which produce a fever (pyrexin), or death of cells (necrosin), or a reduction of leukocytes (leukopenin).

With this latter idea in mind it was thought that it would be better to use a material which stimulates the reticuloen-

dothelial cells throughout the body, with the hope that the desired substance or substances would be secreted into the blood from which it or they could be extracted free from toxic or undesirable substances.

Production of Extract

Extract 1 was made as follows: a culture of *Actinomyces bovis* (Hartz) was prepared. The organisms and spores were subjected to cytolysis with sodium taurocholate (2%). An amount sufficient to make the average horse mildly sick was injected intravenously. Some horses received several injections. Four weeks later the horse was bled and the serum separated. The serum was extracted three times with three or four volumes of ether, and then three times with three volumes of benzene (thiophene free). Organic solvent extracts were combined and the solvents evaporated under reduced pressure at 37 C. Greasy residue was extracted five or six times or more with several volumes of redistilled water and the water was evaporated under reduced pressure at 37 C. The residue was re-extracted with ether and benzene four or five times, extracts being combined and solvents evaporated under reduced pressure at 37 C. The objective was to isolate a substance which is soluble in water, ether and benzene. A white slightly brown or cream-colored powder was obtained. The average yield per horse has been 1 mg.

Chemistry

The material is soluble in water, vegetable oils, alcohol, ether and benzene, and sparingly soluble in mineral oil. It withstands 250 F. for 15 minutes. In aqueous and vegetable oil solutions it tends to deteriorate. It is stable in mineral oil. Microchemical examination has shown that the product contains carbon, hydrogen, oxygen and probably a trace of sulfur. If it contains nitrogen, it is only present in traces. The results of infrared spectroscopy indicate that two substances may be present, one a polysaccharide and the other either a carbohydrate acid, or a fatty acid. The two may be conjoined. More material than is at present available will be required to complete the chemical study.

Extract 1 in this study was dissolved in mineral oil (no. 9 light) to prevent deterioration and to obtain slow absorption.

Toxicity

Extract 1 has not been found to be toxic in mice, rats, guinea pigs, dogs, or man when given subcutaneously in 100 times what is termed the unit dose. Doses of 0.01 mg. given twice a week for two or three months or longer to mice have no effect on their growth.

Dose

Since the product in Extract 1 hypothetically represents a local autacoid or "hormone," one would expect it to be a very potent chemical agent.[26] The unit dose used in this study has been 0.01 mg. The largest dose used in a large dog in this study has been 0.04 mg. every two weeks. The usual dose has been 0.02 mg. every two weeks in a 20 lb. dog, increased to 0.04 mg. if the lens did not respond.

This relatively small dosage-rate was se-

The extract described is produced by the same process as the controversial alleged cancer cure known as Krebiozen. Krebiozen has been pronounced ineffective for treatment of cancer in at least two JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION *reports. In view of adverse or at least misplaced publicity surrounding the early development of this agent, the temptation to refuse publication is great. On the other hand suppression of research finding of potential significance is equally serious. To investigate and report does not constitute blind endorsement. This report is presented in* VETERINARY MEDICINE *on the basis of thorough clinical observations and reliability of veterinary investigators involved in the studies.*

lected because physiologically the development of senile cataract represents a slowly progressive abnormal change in a tissue associated with ageing and, on the basis of existing evidence, it is also associated with a decrease in the growth rate and metabolic activity of the epithelium of the lens. So, it did not appear to be physiologically desirable to seek to use a dose which might too rapidly reverse this process of ageing of the lens. It was suspected that if a larger dose were used the lens might undergo excessive hydration and cause damage, perhaps glaucoma. The optimum dosage-range is yet to be determined.

Clinical Material

Source. All dogs used in this study were referred by veterinarians in the Chicago and Urbana metropolitan areas. Dogs were brought to our laboratory by owners for examination and treatment, as a rule, once each month. A mid-month injection was usually made by the referring veterinarian.

General History. During the first visit, the name, breed, sex, age, and body weight of the dog was recorded. Dogs were all in good general health. A history of prior illnesses was sought and specific questions were asked about rickets, diabetes, distemper, convulsions, and accidents. None of the dogs had a history of rickets, diabetes, or distemper. In most cases, urine was examined for sugar.

History of Trauma in Relation to Cataract. Dog no. 1, ten years of age, had been bitten on the head about three months before the first cataract appeared and six months before the second. Dog no. 2, 3½ years of age, had been in an automobile accident and had experienced an occasional convulsion since the accident. The first cataract developed about 12 months and the other about 18 months after the accident.

The cataracts in dog no. 2 and one in dog no. 1 were mature and diffusely opaque like the usual senile cataracts. One cataract in dog no. 1 was an early cataract, which permitted a faint green pigment reflex to be obtained at the periphery of the lens without blood vessels being visible.

History of Other Diseases in Relation to Cataract. One animal had been diagnosed as having "canine hepatitis" without jaundice at about five months of age. At seven months of age a cataract was detected in the left lens and at eight months in the right. Both lenses were diffusely opaque. The posterior capsule appeared to be primarily involved in the left eye and the central portion in the right eye. A green pigment reflex could not be seen in either eye. A second animal, one year of age, had had trouble getting around "since he was a puppy," a difficulty which had suddenly increased about three months prior to the first visit and caused the dog to "bump into things" in the house. The dog had a nuclear type of cataract in both eyes with opaque spokes radiating to the periphery, the spokes being very evident in the right eye. The area between the spokes was sufficiently opaque so that only a faint green pigment reflex was visible.

Results

Dr. L. E. Fisher, of Chicago, has followed for us ten untreated dogs with cataract for from seven months to four years and Dr. A. G. Schiller, of the Veterinary College at Urbana, has followed two dogs with cataract for several months. No evidence of clearing of the cataract of these untreated dogs has been observed. We injected a dog with bilateral cataract with a pyrimidine derivative for almost a year without observing any clearing of the lens.

R. H. Smythe[30] in his book on *Veterinary Ophthalmology* makes the following statements: "A true cortical cataract spreads until it involves the whole eye but a lamellar cataract in time may become absorbed, particularly if the plane of nutrition is kept at a high level with special attention to the provision of vitamin D. . . Lamellar cataract is usually seen in young animals and rachitic types." Goldman[30] of Germany states that he has never observed a clearing of the lens in senile cataract in dogs. Brumley[31] in the textbook of *Diseases of Small Domestic Animals* writes that "Occasionally traumatic cataract develops rapidly and undergoes a spontaneous recovery within a short time. Such cases are rare."

Time From Detection of the Cataract to the Start of Treatment. The age of the

cataracts could not be precisely determined.

For the purpose of tabulation and comparison, the average age of the youngest cataract was established from the time the dog started "to bump into things." In those dogs with a cataract in one eye only, the time at which the dog "bumped into things" on the side of the cataract was used. In some cases, a time of onset had been noted by the owner and a veterinarian in one eye before it was noted in the second eye. When this information was available, the time of onset of the younger cataract was assumed to be when the dog started to bump into things on both sides. When there was no information indicating that the cataracts in a dog had not occurred at different times they were recorded as occurring simultaneously.

The average time from the detection of the younger cataracts to the start of treatment, was 6.9 months, the range being from one to 24 months. The average time lapsing from detection of the older cataracts to the start of treatment was ten months, the range being from one month to five years.

Clearing of the Opacity of the Lens. It will be noted (table 1) that definite clearing of the lens, on the average, occurs sooner after the start of treatment in the younger cataract. Some clearing occurred in 26 of 27, or in 95% of 27 dogs in the case of the younger cataracts and in 19 of 21, or in 90% of the older cataracts.

The average time after the start of therapy for a definite clearing of the opacity to occur in the younger cataracts was 2.4 months, the range being one to six months. The dog in which no change has been seen in the younger cataract has been treated only 4.5 months. The clearing in another dog treated for ten months was questionable, but the green pigment became visible.

The average time after the start of therapy for a definite clearing of the opacity to occur in older cataracts was 3.3 months, the range being one to seven months. It should be indicated that four of the 27 dogs had a cataract in only one lens; in one dog an eye had been removed; one dog had a subluxated cataractous lens. One of the 21 remaining dogs (dog 9) showed a questionable change after ten months of therapy, but the green reflex became visible. In another (dog 4) the lens has shown only a questionable clearing, but the dog was treated only for 4.5 months.

In table 2 the amount of clearing of the opacity of the lens in the various dogs is shown. The average amount for the right eye was 49% and for the left, 37%.

The average time for the green pigment reflex to be seen by ophthalmoscopy after the start of therapy was 5.0 months in 39 of 48 or 81% of the cataractous lenses, the range being from one to 13 months. It appeared in an average of 4.3 months (range, one to nine months) in 24 of 27 or 90% of the younger cataractous lenses, and in an average of 6.1 months (range, two to 13 months) in 15 of 21 or 71% of the older cataractous lenses. (table 1.)

It is noteworthy that the average time for the appearance of the green pigment reflex in the eye with the younger cataractous lens was 4.3 months and that the average time at which the owners reported an improvement in functional vision was 4.2 months (table 1). Thus, the reappearance of the green pigment reflex, as a general rule, checks with an improvement in vision. This is not uniformly the case, however.

Blood vessels of the retina became visible by ophthalmoscopy in 21 of 48, or 45% of the eyes in which they were not visible prior to treatment. They became visible in an average of seven months after the start of treatment, the range being from one to 28 months. In the eyes with younger cataracts the vessels became visible in an average of 5.5 months; with the older cataracts, 8.8 months (table 1).

Blood vessels did not become visible in 27 of 48, or 55% of the eyes after an average of 7.4 months of treatment, the range being from two to 17 months. On the basis of the time factor the blood vessels should become visible in most of these eyes.

It is interesting to note that several owners reported that when vision started to improve the dogs could see better outside in bright light than inside the house in dim light.

Recurrences. When the dog's vision had shown a good practical recovery and the owner wished to discontinue treatment, we did not urge the owner to continue. It was desirable to ascertain whether the cataract

TABLE 1

Dog No.	Age of Dog Yr.	Before Treatment: Age Cataract		After Treatment: Time Definite Clearing		Time of Green Reflex		Time Blood Vessels Visible		Time Owner Reported Recovery of Vision Mo.	Total Duration of Treatment Mo.
		Younger	Older	Younger	Older	Younger	Older	Younger	Older		
8	17	2 yr.	5 yr.	1 mo.	1 mo.	1 mo.	none	none (2 mo.)	none (2 mo.)	1	2
7	16.5	1 yr.	2 yr.	6 mo.	6 mo.	6 mo.	6 mo.	none (5 mo.)	none (5 mo.)	6	6
6	10	2 yr.	sublux.	1 mo.	sublux.	4 mo.	sublux.	none (7 mo.)	sublux.	could see at start	9
25	10	18 mo.	eye clear	2 mo.	eye clear	5.5 mo.	eye clear	clear initially	none (6 mo.)	5.5	6
13	4.5	18 mo.	18+ mo.	3 mo.	3 mo.	4 mo.	9 mo.	5 mo.	6 mo.	3	13
10	4.5	16 mo.	16+ mo.	2 mo.	eye removed	2 mo.	eye re-moved	none (16 mo.)	eye exercised	2	16
1	10	6 mo.	12+ mo.	2 mo.	5 mo.	2 mo.	5 mo.	2 mo.	23 mo.	2 or 5	15
15	11	9 mo.	9+ mo.	6 mo.	6 mo.	8 mo.	none (?)	none (10 mo.)	none (10 mo.)	8	12
18*	1	6 mo.	7+ mo.	1 mo.	2 mo.	2 mo.	3 mo.	2 mo.	3 mo.	1	10
22	2	6 mo.	6+ mo.	3.5 mo.	3.5 mo.	9 mo.	9 mo.	none (9 mo.)	none (9 mo.)	none (?)	9
4	2.5	5 mo.	5+ mo.	2.0 mo.	none (?)	5 mo.	none	none (10 mo.)	none (10 mo.)	none (?)	10
14	3.5	5 mo.	12+ mo.	1 mo.	1 mo.	6 mo.	6 mo.	none (6 mo.)	none (6 mo.)	6	12
28	5	4 mo.	4+ mo.	4 mo.	4 mo.	none (?)	none (?)	none (4 mo.)	none (4 mo.)	4	4
20	5.5	3 mo.	8+ mo.	6.5 mo.	6.5 mo.	6.5 mo.	6.5 mo.	6 mo.	6 mo.	6.5	9
2	3.5	3 mo.	7+ mo.	1 mo.	1 mo.	2 mo.	3 mo.	14 mo.	none (17 mo.)	3	17
24	3	3 mo.	eye clear	1 mo.	eye clear	6 mo.	eye clear	clear initially	9 mo.	6	8
23	6	3 mo.	3+ mo.	3 mo.	3 mo.	11 mo.	11 mo.	10 mo.	none (10 mo.)	6 (?)	9
5	4	1 mo.	3+ mo.	2 mo.	4 mo.	2 mo.	4 mo.	2 mo.	14 mo.	2	28
26	8	1 mo.	2+ mo.	4 mo.	4 mo.	5 mo.	none	none (6 mo.)	none (6 mo.)	4	6
27**	1	2 mo.	2+ mo.	3 mo.	3 mo.	3 mo.	3 mo.	4 mo.	none (4 mo.)	3	4
11	7	1.5 mo.	1.5+ mo.	2 mo.	5 mo.	2 mo.	13 mo.	1 mo.	12 mo.	8	15
16	3	1.5 mo.	eye clear	1 mo.	eye clear	5 mo.	eye clear	clear initially	none (11 mo.)	4	11
19	4	1.5 mo.	eye clear	1 mo.	eye clear	4 mo.	eye clear	clear initially	4 mo.	4	9
9	12	1 mo.	1+ mo.	none	none	none	none	none (4 mo.)	none (4 mo.)	none	4.5
12	4	1 mo.	1+ mo.	1 mo.	2 mo.	1 mo.	2 mo.	1 mo.	2 mo.	1	3
3	3	1 mo.	1+ mo.	1 mo.	2 mo.	3 mo.	3 mo.	8 mo.	9 mo.	3	29
21	5	1 mo.	12+ mo.	1 mo.	1 mo.	4 mo.	9 mo.	none (9 mo.)	none (9 mo.)	none (?)	9
***											
Ave.	6.9	6.9 mo.	10+ mo.	2.4 mo.	3.3 mo.	4.3 mo.	6.1 mo.	5.5 mo.	8.8 mo.	4.2 mo.	

*Canine hepatitis. **Congenital central cataract with spokes. ***Average of 27 dogs. Animal No. 17 was a monkey.

would or would not return. If it returned, such an observation would show that Extract 1 substituted for some body deficiency which was the cause of the cataract.

The treatment has been completely discontinued in three dogs which had manifested a good recovery of functional vision after treatment. The first dog (dog 12) which had lost vision and regained it after treatment, lost it again completely about 3.5 months after the cessation of treatment. It could not be returned for treatment again because when it was about to be returned it was hit and killed by an automobile. The second dog (dog 3), according to the owner, has recently lost some of its vision about 11 months after the cessation of treatment. It will be returned for examination and renewal of treatment. The third dog (dog 14) has not been treated for six months and, according to the owner, has been "losing her sight again" during the past two months. It will be returned for examination and treatment.

In a fourth dog (dog 5), which had shown considerable recovery of vision, the treatment has been given only about once a month during the past eight months, but there has been no noticeable deterioration of vision. The lens and vision are now being observed every month.

"Glaucoma." An unilateral increase in intraocular pressure and size of the eye occurred in two dogs (dogs 3 and 5) which had been treated for more than 20 months. One of the dogs (dog 3) had bumped and injured the left eye between treatments, and a corneal opacity and glaucoma subsequently developed in the eye. Both had been totally blind at three and four years of age and after treatment had recovered good functional vision and from 80 to 90% of the opacity of both lenses had cleared.

Because true glaucoma is relatively rare in the dog, we desired to observe these cases. Neither appeared to be a hydrophthalmus, which may be associated with a luxation of the lens or of a mature cataract, in the dog.[29]

One of the dogs (dog 3) was seen by a veterinarian and a drain was placed in the eye. The eye was then enucleated because the drain became obstructed. The other dog (dog 5) developed an increase in intraocular pressure and size of the left eye, which had slowly increased and looked like glaucoma. The cornea became cloudy. During the past ten months the owner has brought the dog for treatment with Extract 1 only once a month. During this period the "glaucoma" has remained stationary, the cornea has become clearer, and the vision and lenses have remained the same.

Observed Changes in the Cataractous Lens After Treatment with Extract I. Ap-

TABLE 2. Amount of Clearing of Lenses

Dog no.	Period of Treat. mo.	Max. Amount Clearing R. Eye	L. Eye	Dog no.	Period of Treat. mo.	Max. Amount Clearing R. Eye	L. Eye
1	20	90% (3 mo.)	25% (5 mo.)	14	12	50% (6 mo.)	20% (6 mo.)
2	17	50% (3 mo.)	85% (8 mo.)	15	12	15% (12 mo.)	30% (12mo.)
3	29	90% (9 mo.)	90% (3 mo.)	16	11	50% (10 mo.)	eye not involved
4	10	{15%} {none} 10 mo.	15% (10 mo.)	18	10	90% (7 mo.)	25% (7mo.)
5	28	80% (8 mo.)	80% (5 mo.)	19	9	80% (8 mo.)	eye not involved
6	9	sublux.	40% (8 mo.)	20	9	50% (6 mo.)	90% (6 mo.)
7	4.5	{?15%} {none} 4.5 mo.	?15% (4.5 mo.)	21	9	50% (9 mo.)	25% (9 mo.)
8	3	20% (1 mo.)	15% (1 mo.)	22	9	20% (9 mo.)	20% (9 mo.)
9	4.5	{?10%} {none} 4.5 mo.	{?10%} {none} 4.5 mo.	23	9	90% (11 mo.)	25% (11 mo.)
10	16	50% (13 mo.)	one eye removed	24	8	eye clear at start	20% (6 mo.)
11	15	60% (12 mo.)	40% (12 mo.)	25	6	eye clear at start	15% (6 mo.)
12	3	100% (3 mo.)	80% (3 mo.)	26	6	15% (5 mo.)	25% (5 mo.)
13	13	50% (8 mo.)	20% (8 mo.)	27	4	30% (4 mo.)	40% (4 mo.)
				28	4	15% (4 mo.)	15% (4 mo.)

Dogs 4 and 9 did not develop enough clearing of the opacity to see the green pigment reflex; Dog 7 did.

proximately 80% of the cataractous lenses were diffusely opaque as is seen in the senile cortical cataract of man. This type of cataract cleared in one or a combination of two ways.

The first way consisted of a uniform diffuse clearing or decrease in opacity at the periphery of the lens, which left the central portion of the cataract with a fuzzy but smooth circular profile.

The second way consisted in the development of striations which resembled but were not as broad as the "water clefts" of incipient cataract in man. The striations usually amounted at first to two or three in number, running from the periphery, some in an irregular course and others to the center of the lens to form wedges or sectors with the base at the periphery of the lens. The striations would broaden some and the wedge would break up and appear like cirrus clouds in a clear sky. These scattered patches then slowly disappeared. The striations might increase in number forming several wedges about the periphery. The opacity would then break up, clear peripherally and leave a central irregularly serrated portion which would slowly disappear. When viewed laterally the clear spots appeared to have been scooped out of the surrounding opaque material.

Approximately 20% of the lenses at the start of therapy contained a few striations. The clearing then occurred as described for the diffusely opaque cataract after the striations had appeared.

In the one case of juvenile or congenital cataract, the opaque areas between the spokes cleared. The spokes had not cleared at four months after the start of therapy.

The most characteristic feature of the clearing process is that it starts from the periphery and proceeds toward the center. This should be expected because the lens is thinner at the periphery and the formation of new lens fibers would first become apparent there.

In two of the dogs in which the lenses have cleared almost completely, a golden colored nuclear body was located at the center of the lens (dog 3 and 15). In dog 3 the "body" has now practically disappeared. Others which have not cleared completely have opaque centers which are smooth or serrated in outline.

In two dogs, during the first two or three months of treatment, the lens appeared to be watery or swollen throughout, especially at the periphery of the lens. This was not characteristic of the other lenses, though in a few other cases the impression was gained that some swelling existed.

Extent of Clearing of the Lens. The lenses clear at different rates in the same and different dogs. Some lenses clear rather rapidly during the first three to six months and then clear very slowly, if any; 12% of the lenses have cleared up to 90 or 100% of normal in three to nine months. Others clear very slowly but progressively, even at the periphery. In our experience a lens may not start to clear appreciably for four or six months after the start of therapy, and some clearing may continue to be observed up to 20 months later. The most refractory lens (dog 4) showed only 15% of clearing after ten months of therapy.

There is no perfect way of measuring the extent of the clearing of the lens. Photography is the most objective and the best. But, by using the photographs we have not yet developed a method of quantitating the increasing amount of light passing through the pupil as the opacity of the lens clears. So, at the present time it is necessary to estimate by inspection of the eye and of the photograph the amount of clearing that has occurred.

Contraindications

We have not observed any contraindications. Hypothetically none should occur, except an undue swelling of the lens which might interfere with the drainage of the aqueous humor and cause an increase in intraocular pressure. The one dog which developed an increase in intraocular pressure and size of the eye with no previous history of injury to the eye has caused us to suspect glaucoma may be found to be a contraindication. In at least two other dogs a swelling of the lens during the early part of the treatment was observed.

Observations establish unequivocally that cataracts in dogs may be cleared to a variable extent by the medical treatment

Discussion

used in this study. Two dogs which had manifested a decided improvement in vision showed deterioration several months after withdrawal of the medication.

The evidence does not unequivocally prove that Extract 1 was the cause of the clearing of the opacity of the cataractous lenses because a group of dogs with cataract were not injected with no. 9 light mineral oil, which was the solvent used for the extract. From a scientific viewpoint this type of control group should be observed. But, whether the clearing of the opacity of these cataractous lenses was due to mineral oil or to Extract 1 does not detract from the great biological and potential therapeutic significance that one, or the other, or a combination of both was responsible.

The nature of the action of Extract 1 is probably a very involved problem and much research will probably be required to solve it. This research would involve an histological, physiological and biochemical study of the epithelial cells of the lens which we believe may be primarily involved in most types of cataract. Such studies would have to be made at various stages of the clearing of the opacity.

Summary

Twenty-seven dogs, with a cataract (80% mature) in a total of 48 eyes, were injected intramuscularly repeatedly with a product extracted from horse serum after the injection of a cytolyzed culture of *Actinomyces bovis*. The product contains a polysaccharide and either a carbohydrate acid, or a fatty acid. It is nontoxic in animals and man.

A variable amount of clearing of the opacity occurred in 95% of the younger and 90% of the older cataracts. Evidence of clearing occurred on the average in 2.4 months and 3.3 months in the younger and older cataracts, respectively, the range being from one to seven months. The green pigment reflex became visible after an average of five months of treatment in 39 of the 48 (81%) cataractous lens, the range being one to nine months. Retinal blood vessels became detectible in 21 of 48 (45%) of the eyes in an average of seven months, the range being from two to seventeen months. With continued treatment the percentage will probably be increased from 45% to approximately 75%. In 85% of the cases the owners reported a return or improvement in functional vision in bright light at the time the green pigment reflex became detectible by ophthalmoscopy. To date the average extent of clearing of the cataractous lenses has amounted to 43%. In 12% of the lenses the clearing has amounted to 90% or more.

After decided improvement in the lens and in functional vision had occurred, treatment was discontinued in three of the dogs. In two, a deterioration in vision has occurred. One of these dogs became blind again and was killed in an automobile accident. The other two dogs will be re-examined and treatment may be resumed.

Glaucoma has developed in two of the dogs. In one it has become stationary after reducing the dosage-rate by one-half. In the other dog the glaucoma was probably traumatic and was subjected to an operation. Glaucoma may develop into a contraindication, especially if the dosage-rate is too high for the individual animal.

Conclusion

Evidence has been obtained showing that the opacity of the canine lens, which is referred to as cataract, may be cleared to a therapeutically significant extent.

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Small Animal Practice Notes

DR. W. F. KELLER, Michigan State University, is experimenting with an interesting dry ice method for spot destruction of dermoid tissue. He is working with a device made by the Kidde Co., Bloomfield, New Jersey, which uses a carbon dioxide cartridge to form a small pellet of dry ice. The small piece of dry ice is handled on the end of a special applicator for controlled contact to selected tissue sites. In human medicine this technic is used on warts, callouses and acne. It appears that a single application for 60 to 90 seconds will remove warts. In two to three days the treated wart forms a hard callous and in six or seven days drops off. Additional trials are needed to determine the exact role of this technic in veterinary medicine.

Dr. V. J. CRAGO, Youngstown, Ohio, told Illinois veterinarians that a practice must grow or go down hill; there is no standing still. Growth must come in quantity or quality. He has chosen to concentrate on quality because he believes it's easier to collect for good service from clients that believe in veterinary medicine than to fight for more clients. He feels that big buildings impress veterinarians more than clients and are a poor substitute for good veterinary service and client relations. By operating on an appointment basis he has achieved better control of his time and does a better job with more income and gives more thoughtful consideration to the convenience of the client.

A VETERINARIAN recently commented that he had just tried the radical surgical procedure recommended by Ott for chronic otis. Asked if the procedure was as bloody as the movie description suggested, he said it was pretty bad and he only did one ear on this old dog since she had lost enough blood for one day. He intended to go back and do the other ear and give it a further try. As he pointed out, there is little to lose in these severe cases. Thickening is too extensive for any other procedure. Complete removal is about the only possible way out.

SEVERAL VETERINARIANS report that when attempting to immunize very young puppies against distemper, especially toy breeds, one will occasionally be presented several days after injection in a comatose-like condition. One practitioner says that B_{12} will straighten these out in a matter of minutes and another reports equally dramatic results with glucose. Some type of metabolic disturbance is apparently involved.

A PRACTITIONER FRIEND at a recent meeting commented that he had removed his first petella and was amazed how the patient is able to get around. No one in the group could remember the exact anatomy involved, but it was agreed that at least in the toy breeds, the petella apparently serves little useful function.

CLINICAL REPORT

Physiological Management of Diarrhea

W. J. FOSTER, V.M.D. and K. M. GODDARD, D.V.M.

Clifton, New Jersey

GASTROINTESTINAL DISORDERS OF THE DOG rank as major clinical problems. Almost unlimited combinations of etiological agents, predisposing and complicating factors contribute to the frustration of those who have a regard for systematic diagnosis and specific therapy. Circumstances frequently dictate initiation of therapy before a presumptive diagnosis can be confirmed.

If our experience is typical, far more gastrointestinal disorders are treated empirically than are given specific therapy. There is no need for rationalization of this attitude. If pyrexia, dehydration or toxemia are apparent, all laboratory tests feasible are applied in an effort to determine specific etiology. Otherwise, we treat small animal diarrhea according to the medical problem presented.

Comprehensive therapy of diarrhea must be directed at four distinct clinical entities: disturbed nutrition, gastrointestinal hypermotility, inflammation and infection. These entities vary in relative significance between given cases. It follows that emphasis on therapy of any phase must vary as the case requires and that better response is noted when each component of the syndrome is treated.

Discussion and Findings

That nutritional upset exists prior to or coincidental with diarrhea is well recognized.[1] In this condition, nutrient intake is limited and processes of digestion and absorption of nutrients are seriously impaired. Physiological and metabolic requirements of certain water soluble vitamins and other essential elements are enormously increased.[1,2] At the same time, an exhorbitant loss of these nutrients and electrolytes is in progress.[1,2,3]

Ingested food may cause or contribute to development of diarrhea. Consumption of an excessive amount of food is a frequent factor. The quality and composition of food is a factor; *e.g.*, it may contain mechanical irritants (bone fragments, tracheal rings, etc.), have a high content of indigestible materials or may contain allergens, pathogens, or toxins.

To treat the nutritional component of diarrhea while dogs are in the hospital, we routinely use Prescription Diet (I/D — Hill) plus liberal supplemental vitamins administered orally or by parenteral route if necessary. After the animal is sent home, we advise feeding well cooked chopped beef and cottage cheese or boiled rice.

Hypermotility of the inflamed gastrointestinal tract, usually indicated by emesis or diarrhea, initially serves as a means of quickly removing noxious material from the tract and as a meaningful symptom of upset physiology. Excessive or prolonged diarrhea causes upset fluid balance, rapid dehydration, incomplete digestion and absorption of nutrients, promotes toxemia and lowers resistance to infection.

A recently introduced compound (Diathal — Schering) affords immediate and effective control of diarrhea. One ingredient is diphemanil methylsulfate, an anticholinergic drug, which selectively suppresses parasympathetic motor and secretory activity of the gastrointestinal tract. At relatively low dosage levels, this drug will suppress spastic contractions which contribute to rapid peristaltic propulsion of ingesta through the tract. Slowing the rate of propulsion of ingesta sharply cuts frequency, number and volume of evacuations. Lowered rate of propulsion permits colonic reabsorption of water, which halts progressive

water loss and aids in re-establishing digestion and absorption of nutrients. Renal clearance of accumulated toxic metabolites is facilitated by restoration of fluid balance in the dehydrated animal. Experience suggests that use of this anticholinergic is an effective physiological addition to any system of antidiarrheal treatment.

We have noted two side effects related to anticholinergic action which are apparently without clinical significance. This drug halts secretion of saliva; thus some animals show xerostomia or 'dry mouth' symptoms. A minor degree of mydriasis may occur.

In man, existence of gastric retention, glaucoma, prostatic hypertrophy and cardiospasm preclude continuous anticholinergic drug therapy.[4] This information suggests a possible contraindication in animals when gastric or intestinal obstruction or intestinal atony are diagnosed. An occasional nervous or hysterical dog may vomit after injection of Diathal. This reaction is usually ascribed to fright but may possibly be influenced by antisialitic action or antibiotic allergy.

Routine Use

We routinely administer 0.25 to 0.5 cc. Diathal intramuscularly, once daily to dogs weighing up to 10 pounds; 0.5 to 1.0 cc. is given to dogs in the 10 to 30 pound range. Larger dogs receive 1.0 to 2.0 cc. In severe cases, this dose may be given twice daily. We also note that increased dosage both intensifies and prolongs antidiarrheal effect; some animals having no bowel movements for 48 to 60 hours, at which time the feces appear normally formed.

An inflammatory reaction of the mucosa is a constant finding in diarrhea. As stated above, the primary functions of the mucosa are curtailed. According to the nature and magnitude of the insult, all degrees of tissue damage, from mild catarrhal inflammation to necrosis, are encountered. The recuperative and regenerative powers of gastrointestinal mucosa are great, provided the insult is removed and rest given.

Diphemanil methylsulfate has been widely prescribed for several years as an aid in management of gastric or peptic ulcer and ulcerative colitis in human medicine.[5,6,7,8]

Controlling gastrointestinal spasticity in the dog is a logical extension of this medical usage. Intestinal protectives (kaolin, pectin, aluminum hydroxide, bismuth, etc.) are required only in severe cases.

One consequence of the inflammatory response is lowered resistance to infection. Ubiquitous intestinal flora may become opportunistic pathogens or ingested pathogens may become established.

Diathal offers effective systemic wide-spectrum antibiotic activity against such organisms as may invade the general circulation. Each cubic centimeter contains 200,000 units of penicillin G procaine and 250 mgs. of dihydrostreptomycin sulfate. If specific pathogens are isolated and identified, we make sensitivity tests, following up with the indicated antimicrobial therapy.

We often observe diarrhea secondary to systemic infectious disease (e.g., distemper, histoplasmosis or hepatitis) and parasitisms. Obviously, antidiarrheal therapy must be accompanied by the indicated primary therapy. Occasionally, a non-specific diarrhea occurs in excitable or nervous dogs. For lack of a better term, we describe it as neurogenic diarrhea. Tranquilizers are suggested as a helpful adjuvant in such cases.[9]

Case Reports

Since April 1958, sixty-two dogs have received Diathal for various gastrointestinal disturbances in our hospital. Four cases, showing chronic, persistent diarrhea as a result of heavy infestation of intestinal parasites (tapeworms, hookworms, roundworms and coccidia), failed to respond satisfactorily until proper anthelmintics were also administered. This points up the obvious necessity for routine diagnostic procedures.

Four other cases, severe exacerbations of chronic diarrhea, required daily injections of the drug for five days plus dietary adjustment to bring their conditions under control. A typical case was that of a 75 lb. German Shepherd with a history of severe hookworm infection as a puppy, followed by a chronic intermittent diarrhea for several months. When presented, an acute, liquid, greenish, blood-tinged diarrhea was evident. An enema resulted in passage of much foreign matter, mostly chicken bones, and mucous. Stools returned to normal after five days of drug therapy and dietary adjustment. In this particular case we felt

the dose used (1 cc. b.i.d.) should have been increased.

Of the 62 cases in this investigation, 54 showed good to excellent response within six to 48 hours. The rapidity with which frequent watery stools were checked was considered remarkable. Etiology of these cases ranged from simple engorgement diarrhea through the whole spectrum of nutritional, infectious, allergic and toxic conditions which routinely confront the small animal practitioner.

Summary and Conclusions

A simple, yet flexible, approach to management of gastrointestinal disorders of the dog is presented which recognizes the existence of four distinct clinical entities, nutritional disturbance, hypermotility, inflammation and infection.

Use of an anticholinergic agent with a high degree of gastrointestinal specificity aids correction of diarrhea by utilizing intrinsic physiological mechanisms of the animal.

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Pet Bird Tips

FOR SURGERY, pluck feathers, clean with saline, use plastic bag with ether soaked cotton as anesthetic. Silk, nylon or 000 catgut make good sutures. For local anesthetic use ethyl chloride — never procaine in any form because of toxicity.

PENICILLIN (1,000 units) can be used daily without procaine. Be careful in handling birds with respiratory diseases. Keep patient warm — 80 to 85 F. Tincture of benzoin is useful as an inhalant.

FOR DERMATITIS, a cardboard Elizabethan collar is helpful — 2 in. in diameter with 1 in. hole. Mites can cause a scaly face. Treatment is cod liver oil ointment rubbed in daily for several weeks, or paint with gentian violet.

REGURGITATION IS NORMAL. If excessive, remove mirrors and toys from cage and check crop for gas fermentation. Crop may need to be drained with 25 gauge, ¾ in. needle and injected with weak potassium permanganate solution, or opened to remove viscous material and sewed shut again.

FOR DIARRHEA, cut cloacal feathers, clean with soap and water, and soothe with oil locally. Feed strong tea, barley water, paregoric, kaopectate, insoluble sufa drugs and broad spectrum antibiotics. For red mites, dust with rotenone or pyrethrum powder. Use no DDT. Clean cage with soap and water and ammonia. Paint with lead-free products.

MALE BIRDS occasionally develop a disease called brown hypertrophy of the cere and may then be confused with females.—*Harry Goldwasser, D.V.M.*

THE CANARY has not changed much in popularity through the years. The folks who like a good singer will stay with the canary. In contrast to the parakeet, I would say we average one every other day. The common canary seed package has a basic mixture of rapé and canary seed and, in addition, other seeds like poppy, thistle, flax, sesame, and some flakes of egg yolk. Fresh water should be available at all times. Greens should be offered. Vitamin-mineral mixture should be added to the seed.—*Lester E. Fisher, D.V.M.*

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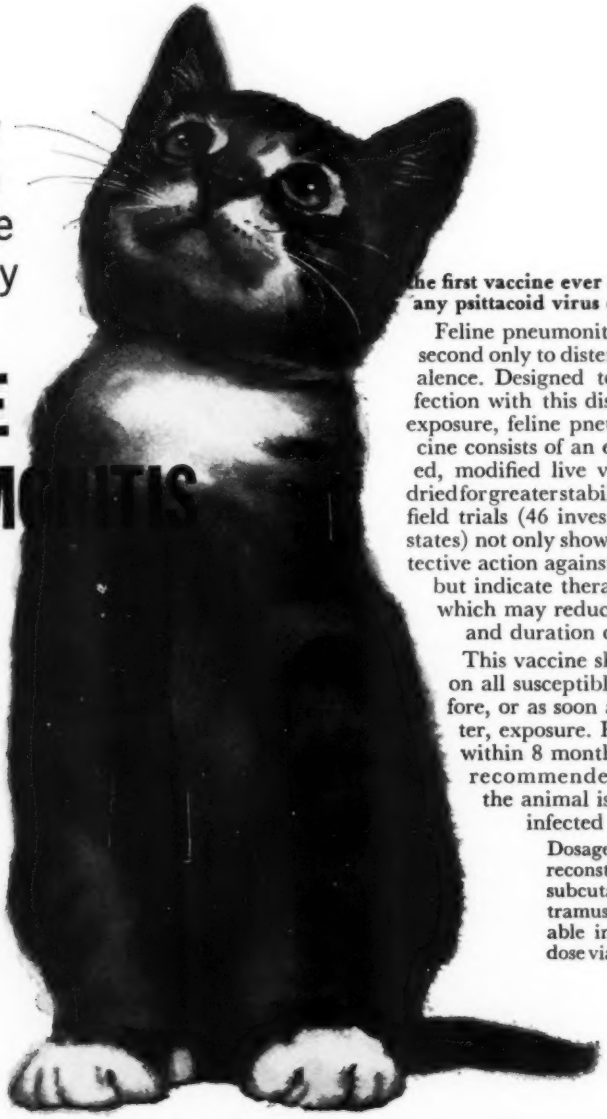

the first vaccine ever developed for any psittacoid virus disease

Feline pneumonitis is a disease second only to distemper in prevalence. Designed to prevent infection with this disease prior to exposure, feline pneumonitis vaccine consists of an egg-propagated, modified live virus, vacuum dried for greater stability. Extensive field trials (46 investigators in 13 states) not only show a highly protective action against pneumonitis but indicate therapeutic effects which may reduce the severity and duration of the disease.

This vaccine should be used on all susceptible animals before, or as soon as possible after, exposure. Revaccination within 8 months to a year is recommended whenever the animal is placed in an infected environment.

Dosage is 1 cc. of the reconstituted vaccine, subcutaneously or intramuscularly. Available in 1 or 5 single dose vials with diluent.

(Bio. 804)

extensive field trials show 86% of cats protected by vaccine				therapeutic effects also indicated			
No. of cats	Status	No. of cats remaining well	No. of cats developing symptoms	No. of cats	Status	No. of cats recovering in 5 days	No. of cats remaining sick after 5 days
1462	vaccinated	1254 (86%)	208 (14%)	611	treated	449 (74%)	162 (26%)
809	controls	483 (60%)	326 (40%)	379	controls	66 (17%)	313 (83%)
field use in noninfected cats				field use in infected cats			

PITMAN-MOORE COMPANY Division, **ALLIED LABORATORIES, INC.**, Indianapolis, Indiana

This study was initiated in an effort to establish a pattern of vaginal changes in the normal animal to guide diagnosis and treatment of infertility. While extensive knowledge has been accumulated, practical application under farm conditions must await development of a simple method of making highly diagnostic smears, the writer reports.

Bovine Vaginal Cytology

H. W. Reuber, D.V.M.

Stillwater, Oklahoma

THE WIDE USE OF ARTIFICIAL INSEMINATION and the growing problems of bovine sterility have made it desirable to follow the events in the bovine sexual cycle more closely. Since the entire reproductive tract undergoes cyclic changes under the influence of ovarian hormones, alterations in the vaginal epithelium should be a criterion of ovarian function and of stage of the cycle. Many conflicting reports on the reliability of vaginal smears in following the bovine cycle have been recorded.[7] This study was undertaken to compare the various methods of making vaginal smears, and if possible to describe the pattern of vaginal changes as they occur in a normal cow. This pattern, once established, could serve as a guide in the diagnosis and treatment of cows with abnormal cycles.

The cyclic cellular changes of the bovine vagina have been described in detail and correlated with the sexual cycle in the cow.[11,12] However, these findings have not been generally accepted because many vaginal smears deviate from the described sequence without any apparent reason.[4,7] The irregular cellular changes have been attributed to low hormone levels, short estrus periods, and a vaginal structure histologically different from that of other animals.

Methods and Materials

The vaginal cytology of seven mature dairy cows with normal cycles was studied daily. Vaginal contents were transferred onto a slide for staining, by (1) patting a slide against the wall of a dilated vagina,[2] (2) by aspirating some vaginal contents into a pipette with a rubber bulb on one end,[3] or (3) by the use of a pipette. With this latter method a plastic inseminating pipette was inserted about 5 in. into the vagina, gently rolled, and withdrawn. The end of the pipette was then touched to some normal saline on a glass slide. After the slide was dry it was immersed in fixing solution.

The following staining methods were tried: hematoxylin-eosin, Schorr's single stain,[9] Schorr's trichromatic stain,[9] and Papanicolaou's stain.[8]

Results

Smears taken with a plastic inseminating pipette and stained with hematoxylin-eosin were relatively easy to make and resulted in slides with marked differences in staining intensity and color. The other methods were more complicated and did not give uniformly superior results.

All cycles showed the presence of various

types of epithelial cells from large irregular cells with indistinct nuclei and folding edges, to small round cells that were deeply stained. The changes observed were similar but less definite, to those described and depicted by Zupp.[11] Certain trends were noted by correlating the ratio of the cell types with the stage of the cycle. Small deep-staining cells seemed to be predominant about four days after estrus. Usually vaginal leukocytosis was also marked at this time. This metestrus period represents the transition from estrogen dominance to progesterone dominance. Diestrus was evidenced by a change in the ratio of cell types present; frequently all types were present in about equal numbers. The proestrus period, representing the transition from progesterone dominance to estrogen dominance, was manifested by an increasing number of large pale cells with irregular edges. True cornification or keratinization was not observed even during estrus; all of the epithelial cells contained nuclei. Clumping of epithelial cells took place mostly during estrus, coinciding with the period of maximum cell proliferation. Erythrocytes were often present at estrus, at ovulation, and a few were seen during any marked leukocytosis.

Many cycles yielded atypical smears in which epithelial and blood cells showed variations in number and character with no apparent relation to the stage of the cycle. These irregular smears were seen on a few. The cause of such smears was not determined.

When a cow urinated immediately after a smear was taken, a second smear was made. As evidenced by a comparison of such smears, urination had no effect on the cellular content of the vaginal smear.

Discussion and Conclusions

The abundance of vaginal leukocytes seen during metestrus is somewhat like the defense mechanism of an inflammation. This seems to be nature's way of combating any infection or foreign material introduced along with the semen at copulation. Since red blood cells were microscopically visible during any leukocytosis, rather than at estrus and ovulation only, as grossly manifested, the erythrocytes must have passed through the capillary walls by diapedesis.

Unpredictable variations occurring in bovine vaginal smears can possibly be attributed to:

1. The stages of the sexual cycle (proestrus, estrus, metestrus and diestrus) may differ in their respective lengths without greatly altering the total cycle length. Therefore, smear patterns in cycles of the same length will not be similar unless the different phases of the cycles are also of the same duration. Such a hypothesis is difficult to evaluate because estrus is the only stage whose length can be measured precisely.

2. Exfoliated cells separated from their site of origin and freed from the pressure of surrounding cells may assume forms differing from similar cells as they appear in tissue sections. Dehydration or changes in cell turgidity may also be a factor.

3. Common pathological conditions like cervicitis, endometritis, and vaginitis may be present, though clinically undetectable, altering the normal cell picture.

4. Although most of the cells in a vaginal smear come form the vagina, cells may be present from the vestibule, cervix, uterus, and uterine tubes. Cells from the various parts of the genitalia are difficult to differentiate after they have separated from their site of origin.

Because of the frequency with which atypical vaginal smears occur, a single smear or an occasional smear is of little value in accurately estimating the stage of the bovine sexual cycle. As diagnosis depends on a succession of changes, a series or several series of smears may be indicated. One can postulate, but not state with certainty, why some apparently normal sexual cycles yield atypical vaginal smears. The bovine reproductive organs cannot be considered normal or abnormal on the basis of vaginal smears alone.

Rectal palpation, and notation of changes in behavior and in external appearance are more informative and easier to carry out in the cow than is cytology. The use of the latter is not practical under farm conditions, and will be limited to research until a simple method of making smears is found.

Concluded on page 221

V

Editorial

THE HEART of EFFECTIVE PUBLIC RELATIONS

THE INCREASED NUMBER of farm publication articles and advertisements supporting the role of the veterinarian this year is quite striking. It appears that the program of Associated Veterinary Laboratories enlisting the cooperation of editors in support of National Livestock Loss Prevention Year is making a visible dent in spite of strong anti-professional competition. This improved editorial recognition plus advertising support of companies marketing products to veterinarians and increased public relations activity of state associations is blending to create a rather effective campaign.

Progress in veterinary publicity is welcome and desirable, but publicity alone does not constitute effective public relations. Public relations experts have certain technical skills and arts, but they are quick to point out that regardless of budget size and volume of publicity placed, the degree of success is limited to the visible merit of the product to the consumer.

Applied to our problems, public relations means building and maintaining sound and productive relations with clients. It involves interpreting the function and objectives of the profession through the eyes of the consumer public. The only product we have to offer is the services of the practicing veterinarian. This means that the real success or failure of a public relations program is decided at the individual practice level.

The average man is interested in what we do only insofar as it affects him and his family. Through publicity we tell him that his veterinarian is a superior individual, who can be counted on for advice and judgment. As the center of a growing publicity effort, the practicing veterinarian carries a major responsibility to show his community that this publicity is well founded. We have deliberately focused attention on ourselves and must accept this accompanying responsibility. Each practitioner is the veterinary profession in his community. Public judgment is based more on emotions than on technical facts. If we go about our work cheerfully, sincerely and cooperatively the impact can exceed that of professional skills.

We must take advantage of every opportunity to demonstrate technics, to analyze and describe the problem presented and explain the reasons for our actions. We can no longer be afraid of "educating a quack." The best informed livestock owner makes the best client. Investment in the profession in the form of better facilities and group practice advantages are all a part of the job to be done. An announced respect for fellow professionals often supplies the lasting mark of dignity.

Effective publicity can create interest but the heart of successful public relations lies in the hands of the practitioner. The spot light is on, and it is up to each of us to display veterinary medicine a little more effectively in our community. The A.V.M.A. office has available excellent material which can serve as a guide to better public relations at the local level, but we must take the time and interest to complete the job.

MODERN VETERINARY EDUCATION IN AMERICA

CLIFFORD H. EBY, D.V.M.

College of Veterinary Medicine
State College of Washington
Pullman, Washington

As with all branches of science, medical science is never static for long. Today the doctor of veterinary medicine is a skilled scientist; this has not always been true.

Several factors influence the opinion which the public has of the veterinarian. Among them may be listed modern technology and the social and economic structure of a society.

Curriculums have evolved but slowly to comply with society's, and to a certain extent the veterinarian's, concept of his spectrum. Today, however, a new generation with new vistas is changing this fixed, static system of education. Emphasis in education is being placed at far different points than in the past. With society and education in a state of flux, the conservative educator who hesitates to upset the status quo is archaic. Society will demand a veterinarian trained for tomorrow's world, not one trained by yesterday's standards.

In the past 50 years the world has gone through two world wars, seen the atomic age born, and outer space explored. Changes in medical science have been tremendous. Vaccines, antibiotics, hormones, electronics, isotopes, have opened fields in preventive medicine and diagnosis undreamed of a few years ago.

Because of these new developments, emphasis has changed from curative to preventive medicine. With this changing emphasis veterinary medicine must carry its full load of responsibility. Besides the veterinarian's role in curative medicine, he may be technical advisor in the courts, he may be consultant to governments, state, and national, or direct international health organizations. He is today a scientific advisor upon whom society depends, for to society diseases of man and animals and their transmission are important.

It is quite evident that tomorrow's veterinarian will be working under different circumstances. Today, the need is even greater for a fully scientifically trained veterinarian. Yet the need is also impera-

tive for a veterinarian who understands the social aspects of his medicine. One who is dedicated to service and fully cognizant of the changing aspects of society.

Group practice will increase in the future. For though the general practitioner will continue to be the backbone of veterinary medicine, he alone cannot supply the services that will be demanded. Practice will not only become more specialized; it will emphasize more and more preventive medicine. This change cannot be met fully by our colleges merely by the addition of several new courses to already ponderous, overcrowded curriculums. What is needed is a changed attitude and outlook on the part of the profession and its educators. Students must be instilled with the idea that veterinary medicine is not a competitive enterprise, but a service, having little relation between time worked and income. The immense personal satisfaction coupled with an adequate living standard are the products future veterinary practice will return.

To achieve this aim, a broader and fuller curriculum, one radically altered for our outmoded concepts of veterinary practice, is needed. A curriculum that embodies not only scientific studies, but studies of societies, the arts, and our professional heritage. A fuller appreciation of scholarly endeavors will help move the profession into its rightful place in society.

Of course, our colleges have added several new courses and academic standards are high, yet, fundamentally, objectives and spirit are basically unchanged. We train students in the technical aspects only, with the social aspects of veterinary medicine forgotten. The great majority of complaints heard about the profession today stem from a failure to understand or adjust to society's needs. Some call it public relations.

The prospects for veterinary medicine to achieve even greater prestige and respect in the future, to take its place at the top of the learned professions, and to offer its full worth to mankind, are well within the realm of possibility. When we recognize the changes in society and medicine, we can also recognize that a new type of veterinarian and veterinary medical education is needed. Tomorrow, the veterinarian in our society will be a leader directing efforts towards preventive medicine and offering civilization a fuller, happier, and more disease free life. As General Wayne O. Kester noted, "Human medicine preserves life, but veterinary medicine sustains it."

Thus it may be seen that a "new" veterinary college supporting a "new" and broadened curriculum is needed. The step forward must soon be taken lest our opportunity pass. It is to those men of vision who can realize the full potential to all living creatures that only veterinary medicine can so completely offer that the task is allotted. Veterinary medicine can rise with the times or maintain its present position.

BOVINE VAGINAL CYTOLOGY

Continued from page 218

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Ovine Abortion

Ovine abortion diagnostically, epizootically and otherwise is becoming more of a complicated problem. In foreign countries there is a Salmonella-abortus-ovis, said to be specific for sheep. The Vibro fetus infection of sheep and cattle; also the Brucella melitensis abortion of goats also identified in sheep; the abortion observed as a complication in listeriosis and others are enough to give the general practitioner sleepless nights. Recently it has been reported that another virus infection of ewes causes abortion usually approaching full-term, frequently in a mummified form. Sheep men call them "rotten lambs." This agent has been isolated in some flocks in the northwestern states. Since this condition has been known to exist for some time in European countries —notably Scotland—American researchers are familiarizing themselves with methods of control. Paradoxical as it may seem, the more there is learned about animal diseases the more complicated they appear to be.—*R. R. Dykstra, D.V.M.*

A Seasonal Problem

Towards the end of each winter, dairymen generally face problems relating to feeding the cows. The feed supplies (including hay, silage and home-grown grain) are low. There is not enough to last till pasture time. Two alternatives present themselves — buy enough to feed according to the cow's needs or stretch what's available to "make do." Unfortunately, the latter decision is the one too frequently resorted to.

The stretching of available feedstuffs is done by giving less of everything to all the cows and even less than that, proportionately, to the dry cows. The dairyman feels that the milkers need the best of what's available.

What makes this an even more serious problem is the general diminution of quality of the stored feedstuffs as time goes on. Vitamin A activity continues to go down to the point where there may be an insignificant amount left in the stored hay. If no other source of vitamin A is provided, subclinical avitaminosis becomes a reality and franker deficiencies a possibility.

Obviously, this isn't good husbandry. How much must a dairyman save in feed bills to balance off a retained placenta which might have been caused by vitamin A deficiency? Moreover, it has been shown that properly fed dry cows will produce up to 25% more milk during the following lactation than poorly fed cows. Starvation simply doesn't pay.

As veterinarians who see evidence of this kind of thoughtlessness in the barns we visit, it might be worth our while to encourage our clients on to a sound feeding program in these late winter and early spring months. Short feeding the cows is too costly.—*Morris Erdheim, D.V.M.*

Aerosol Oil Spray

The use of an aerosol spray is recommended as the most sanitary method for applying oil to eggs, according to a report presented by K. N. May, University of Georgia, at a recent meeting of the Georgia Poultry Institute in Eatonville. The use of an aerosol dispenser for applying oil directly to eggs avoids the danger of contamination encountered in the dip method. Any of the compressed air sprayers available on the market are suitable for aerosol spraying if they are kept clean. According to May, research workers at Purdue University have developed a special aerosol dispenser for use in oiling eggs.

Oiling aids in preserving quality at cooler temperatures and is adaptable to use by small producers. It should be done within a day after eggs are laid.—*W. R. Hinshaw, D.V.M.*

Mycostatin for Moniliasis

Mycostatin, an antifungal antibiotic, in both practical and semi-purified rations, greatly reduced or completely prevented moniliasis in White Plymouth Rock chicks and Beltsville White turkey poults, reports H. Yacowitz, head nutrition research at Squibb Institute of Medical Research, New Brunswick, New Jersey.

In the experiment, the birds were inoculated with oral doses of *Candida albicans*, a moniliasis or crop mycosis producing fungus. All levels of Mycostatin were effective when administered via the drinking water.

Books reviewed in this department and any other books, if available, may be obtained by remitting published price to the Book Department, VETERINARY MEDICINE, Suite 803 Livestock Exchange Building, Kansas City 2, Missouri.

Practitioner's Bookshelf

OUTLINE OF PARASITES REPORTED FOR DOMESTICATED ANIMALS IN NORTH AMERICA, by *Dr. E. A. Benbrook;* 67 pages. The Iowa State College Press, Ames, Iowa, Publishers. Price — $2.25.

This is a revised (5th edition) of a standard work designed primarily for use by classes in veterinary parasitological research involving both domesticated and wild animal species.

Parasites listed are those reported as occurring in continental North America. This edition includes newly discovered parasites, newly reported hosts, and new locations in hosts — all the most recent scientific information and findings in this area. The author chose to list the parasites according to body structure as a logical and convenient arrangement for teaching purposes. In addition to domesticated animals, all other known hosts are included in each classification.

Benbrook, who is also the author of *Veterinary Clinical Parasitology,* is former head of the department of veterinary pathology and has been a staff member at the college for 40 years.

SPEAKING OF PETS, by *H. H. Miller,* 224 pages, 16 illustration plates. Fleet Publishing Corporation, New York, New York, Publishers. Price — $3.95.

This book is an outgrowth of a weekend syndicated column of the same name conducted by Harry Miller, director of the Gaines Dog Research Center. It is a complete guide to the care and training of the most popular varieties of pets.

An idea of the book's contents can be gathered from the chapter headings, The World Of Pets, Living With Our Pets, Selection of the Pet, The Care And Training of a Dog, The Care of a Cat, Of Budgies and Other Feathered Pets, The In-Water Pets, and Pets a Bit Out of the Ordinary.

THE UFAW HANDBOOK ON THE CARE AND MANAGEMENT OF LABORATORY ANIMALS, by *Alastair N. Worden* and *W. Lane-Petter;* 951 pages. Illustrated. UFAW, London, 1957. Price $9.80. (May be purchased from the Animal Welfare Institute.)

Issued under the auspices of the Universities Federation for Animal Welfare, London, this is a much enlarged second edition of one published in 1947 under the same title. It is the most extensive work yet in print dealing with the handling and care of laboratory animals and it will continue as an indispensable guide for all animal caretakers and laboratory attendants for many years to come. It should be in the library of every laboratory using animals for research purposes.

The book is based on the combined knowledge and experience of over seventy experts in the field. Extensive references to literature are listed. It is well illustrated and includes a very useful table of contents and a complete index.

The Veterinary Record states: "The specialized knowledge of nearly 90 contributors

has been condensed into one volume. The result is a well-balanced book of reference which will be of immense value to laboratory workers and others interested in the welfare of a wide variety of animal species.

"This edition, like its predecessor, will be constantly used by all engaged in problems connected with laboratory animals. The practicing veterinary surgeon will find it a most useful source of information when confronted with patients outside the usual run of domesticated species normally dealt with."

MEAT HYGIENE, by *A. R. Miller, D.V.M.,* 557 pages; 130 Illustrations, Diagrams and Tables; 2nd edition. Lea & Febiger, Washington Square, Philadelphia 6, Pennsylvania, Publishers. Price — $8.50.

This book is designed primarily as a classroom text for courses in meat hygiene. Its completeness and authority, however, make it an equally important reference work for everyone engaged in meat and poultry inspection. Philosophies and accepted practices of meat hygiene are set forth clearly, with precise "how" and "why" explanations.

Antemortem and postmortem examination routines as they apply to live poultry and food animals and their carcasses are described fully. Special attention is given to grade labeling and to adulteration and mislabeling. The many disease processes related to fitness of meat and poultry for human food are considered in detail. The importance of environmental sanitation in the packing industry, as well as structural equipment and inspection facilities are stressed because of their importance in insuring clean meat and clean handling during each phase of its preparation and merchandising.

RODEO BACK OF THE CHUTES, by *Gene Lamb;* 280 pages. Kit Publishing Company, 2400 Curtis, Denver, Colorado, Publisher, 1956. Price — $3.75.

The sport of rodeo is perhaps the only major competitive enterprise in America that depends in the main on a variety of animals. Here the writer probes the many facets — some humorous, some pathetic — of that strange world that marches along the border of the enigmatic. Here, for the first time, is the story of a sport that took form in the cowcamps of the fading west, gathered speed along the trails to the northern feeding grounds, and moved to spectator acceptance in the arenas of our biggest cities. No veterinarian who finds memories of a country boyhood juxtaposed against the tempo of modern living will fail to appreciate the stories in this volume.

The author came from a town so small it has since disappeared; he retains the ring of wit that made Will Rogers the national character during the 1930's; and under it all he tells of a philosophy of life that is dazzling in its purity.

Tour Veterinary Facilities

Brigadier General Elmer C. Young, Chief of the Veterinary Corps in the Office of the Army Surgeon General, visited various professional activities during his tour of the Fort Sam Houston-San Antonio area February 6-13.

Brigadier General Elmer C. Young, left, is shown above with Major General Elbert DeCoursey, Commandant of the Army Medical Service School, and Colonel Daniel S. Stevenson, right, Director of the Department of Veterinary Science at the Brooke Army Medical Center component.

Veterinary interest in professional management of money matters has prompted the editors of VETERINARY MEDICINE *to seek out experts in the field for a series of reports. This is the third report on investments and management of funds for future security.*

Mutual Funds and Dollar-Cost Averaging

S. L. SHOLLEY

Keystone Custodian Funds, Inc.
Boston, Massachusetts

ACCORDING TO LEGEND, the richest man in ancient Babylon was quite a character. He didn't have too large an income and he lived a perfectly normal life without appearing to pinch drachmas or piasters or whatever they were using for money in those days. But he kept growing richer and richer. His curious and frequently impoverished friends were amazed when he finally divulged the simple secret of his financial philosophy.

He saved 10% of his income and made his savings earn for him.

That same formula has worked pretty well for 4,000 years, so there's no reason a modern adaptation shouldn't work for you in the next 12 or 20. The first step is for you to convince yourself that you can afford to invest a specified amount at regular intervals — monthly, quarterly, semiannually. The second is to find the proper medium for this systematic saving.

If you treat your investment account just exactly as if it were an item of fixed expense — like monthly payments on the mortgage or life insurance or the gas and electric bills, for that matter — you should find it easy (and relatively painless) to save systematically. And if you'll do a little simple arithmetic, you'll see the advantage of this regular investment.

Dollar-Cost Averaging

This is an exercise to prove the value of dollar-cost averaging. Suppose both Doctor Ahab and Doctor Brown have $1,800 to invest. Doctor Ahab buys 100 shares of stock at $10 each; when the stock goes to $6, he buys another 100 shares; when it drops to $2 he buys another 100. He now owns 300 shares of stock at an average price of $6 a share. If the stock gets back above $6., he'll start showing a profit.

His friend Doctor Brown, uses his $1,800 differently. Instead of buying three round lots of shares, he makes the purchases of the same dollar amount, $600 each time. When the stock is at $10 a share, his $600 will buy 60 shares; when the stock goes to $6, he will get 100 shares; and when it drops to $2, he will add 300 shares to his holdings. He now has 460 shares. The average price is still $6 a share, but the average cost to Doctor Brown is $3.92. When the stock gets above that figure,

Doctor Brown will start making a profit while his friend Doctor Ahab will have to wait until the price gets 50% higher. By the time Doctor Ahab starts making money, Doctor Brown will be almost $1,000 richer.

In essence, dollar-cost averaging means buying fewer shares when prices are high, more shares when prices are low. Regardless of what happens to security prices, this type of systematic investment has a better chance of success than any other — if you start a program with a realization of all the circumstances.

Continuing the Program

You must be emotionally and financially prepared to continue your program through good times and bad. Market fluctuation actually works to your advantage in dollar-cost averaging because the lower prices go, the more shares you are buying with the same amount of money. It takes courage to continue investing when the market is falling, but that is the time when you are getting more shares for your dollars.

Naturally you must realize that you will suffer a loss if you have to discontinue your plan and sell your shares at a time when the market value of your securities is less than their cost. Similarly, if you are buying the shares of a company that goes bankrupt or whose stock becomes valueless, then you obviously will lose your money.

Finding The Proper Medium

That brings up the second problem: how to find the proper medium for your dollar-cost averaging program.

Approximately 20,000 investors a month are deciding that investment companies, the so-called mutual funds, are the logical answer. Some of them are putting as little as $25 or $50 monthly to work, but their regular small investments are getting exactly the same attention as are the huge investments of wealthy individuals and institutions.

The advantages of investing through a mutual fund are well known to almost two million people who have entrusted some $14 billion to professional management. Instead of risking your money on the fortunes of just one or a few companies, you can own a share in 50 or 100 companies through a mutual fund; you can rest assured that a trained research and supervisory staff is handling the portfolio; and you know that you can liquidate your holdings at any time under normal circumstances.

What kind of records do mutual funds have so far as dollar-cost averaging (or systematic investing) is concerned? If you use just the last ten years as a criterion, most of the better funds have tremendous records, partly because the economy has been reaching new highs despite minor adjustments from time to time. A little better test would be a study of successive ten-year periods.

Regulated Firms

For purposes of dollar-cost averaging, you must be selective in choosing the mutual fund best suited for your purposes. There are now approximately 200 regulated investment companies, many of them differing widely in their investment objectives. For example, there are bond funds for income and reserves, stock funds for income, balanced funds of bonds, preferred and common stocks for both income and growth, and stock funds for growth. Each may be doing a wonderful job toward achieving its primary objective, but under normal circumstances, an income fund is not designed to produce much capital appreciation over the long term, and therefore is not a normal vehicle for a dollar-cost averaging program.

Conclusion

Inasmuch as any good mutual fund will be happy to show you its records for any ten-year period or for its entire history, going back to the very start of the fund, you can figure for yourself what type of program is best suited for your particular purpose, and how successful the fund has been in good times and bad.

Perhaps you won't be the richest man in Babylon, but your chances of achieving investment success will be very good if you take advantage of dollar-cost averaging.

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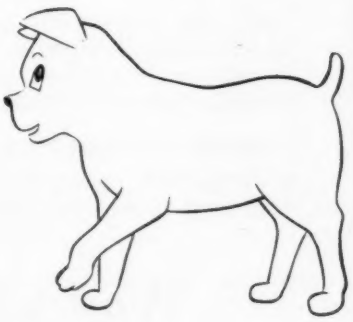

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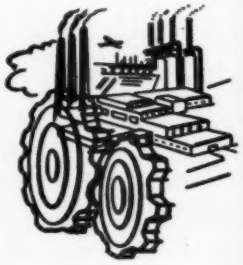

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by Donald M. Nicholson

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To Head Haver-Lockhart Liaison

Dr. James W. Goin, who for the last decade has practiced in central Alberta, has joined Haver-Lockhart as director of veterinary services. He will be liaison agent on technical problems of mutual interest to practicing veterinarians and the Laboratories.

Dr. James W. Goin

A graduate from Ontario Veterinary College, Guelph, he practiced for a short time in Cardston before moving to Alberta.

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KNOLL PHARMACEUTICAL COMPANY ORANGE NEW JERSEY

Here each month are published ideas, suggestions and comments picked up by VM reporters at veterinary meetings.

The Meeting Circuit

AN OFTEN OVERLOOKED FUNCTION of a good professional public relations program is to direct a steady flow of high type young men to the study of veterinary medicine. Today we are in competition with massive publicity programs intended to influence top students into rocket development and pursuits dealing with outer space. The most effective influence of farm youth toward veterinary medicine is the respect and admiration of the veterinarian that calls at their farm.—*Dean Merchant, Iowa State College.*

PREVENTIVE PROCEDURES for control of cancer eye in beef breeds is a popular new service in the south. When cattle are being handled for other purposes it is no great chore to check the eyes for early evidence of involvement. Cauterization of the small white spots observed early works well, especially on the edge of the eyelid. Under local anesthesia the eyeball can be popped out and small lesions shaved off with the Bard Parker blade to prevent or at least delay greater involvement. A simple procedure for this work consists of directing a local anesthetic primarily to the retractor muscles. From an injection site just below the eye a 4 in., 18 gauge needle that has been bent is tilted up under the eyeball. About 2½ in. will place the tip behind the eyeball; 15 cc. of local anesthetic can then be injected into the retractor muscles in three spots. This will permit the eye to be popped out with the fingers but supplies no anesthesia to the lids. Butyn sulfate solution should be used in the eye if surface anesthesia is required.—*Doctor Gibbons, Illinois State Meeting.*

THE PHILLIPS FANMASTER DOSE SYRINGE is recommended by Dr. D. F. Watson as a safe, accurate and practical piece of equipment for sheep medication. A twist of the

wrist passes a flexible tube down the esophagus after the instrument has been positioned in the sheep's mouth. Another twist of the wrist returns the tube to its built-in speculum before removal from the sheep's mouth. —*Michigan State University Conference.*

YOU CAN ENCOURAGE clients to pay $175 to $200 for good tested boars conveying the desired meat type characteristics and efficient growth potential, according to Dr. M. L. Spear, Iowa State College. In addition to the valued breeding improvement he can expect in his own operation, resale value of these boars to the neighbor is excellent.

Increased yearly income has been calculated to attain a possible $892. and even higher. Characteristics that allow for lean cuts and minimum backfat are 60% hereditary.

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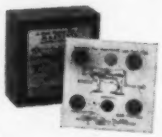

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So that you may be better acquainted with the **MERITS** of our Accuracy Attested — The KO-EX-7 Brom Thymol Mastitis Detectors with the green spots which tell the Degree or Severity of the infection, we will gladly mail you a full sized box FREE upon request. Write today, Sold all over the World.

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New Fifth Army Veterinarian

Colonel William E. Jennings, Veterinary Corps, United States Army was recently assigned as veterinarian for the Fifth U. S. Army with headquarters in Chicago, Illinois upon completion of a three-year tour of duty as chief veterinarian in Europe. In his new assignment he will be responsible for veterinary activities in the 13 midwest-

Col. William E. Jennings

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The "BIG 3" SERIES of CLIPPER BLADE GRINDERS

will save you time and money too!

Sun Ray's scientifically designed and engineered grinders assure you of blades correctly ground to professional sharpness every time.

Easy to Use. No previous experience or special skill necessary. Just remove blades from clipper . . . place on grinder — THAT'S ALL!

Avoid waiting for blades. Save on periodic grinding costs.

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A complete grinding ensemble . . . the ultimate in versatility — HONES, GRINDS, SHARPENS & POLISHES (note protective guard & adjustable grinding rail)

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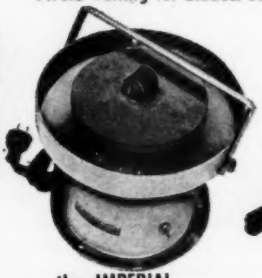
NEW Patent BLADE HOLDER with every Sun Ray grinder

Simplifies grinding — saves wear — prevents abrasions



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ern states which comprise the Fifth U. S. Army Area.

During his European tour, Colonel Jennings represented the American Veterinary Medical Association at several national and international conferences. His official duties necessitated close liaison with veterinary officials in European countries and afforded him an opportunity to observe activities in veterinary educational and research institutions on the European continent.

Poppensiek to Cornell Helm

Dr. George C. Poppensiek, UP '42, will succeed Dr. William A. Hagan as dean of the New York State Veterinary College at Cornell University. He will also become Professor of Microbiology. The appointment will become effective July 1, 1959 upon Dean Hagan's retirement.

Professor Poppensiek is head of immunological investigations at the USDA Plum Island Animal Disease Laboratory on Long Island.

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NOW AVAILABLE
For SMALL ANIMAL HOSPITALS
Quickly Erected - NO POSTS REQUIRED
Can be set on concrete or wood floors or directly upon the ground, joining to, or independent of Building. Composed of strong, self-supporting Fence sections and Gate Units with GATES BUILT-IN and Lockable Latches.
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Doctor Poppensiek has served as Acting Professor of Bacteriology and as Director of the Diagnostic Laboratory at Cornell. He has also been a research associate with the Veterinary Virus Research Institute at Cornell.

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WILL NOT OVERHEAT!

Super efficient, finest quality lightweight heater and dryer ever devised. Special individual heat control for warm or cool air. NEW heavy duty heating element provides hours of constant heat . . . cuts drying time in half. Motor and blowers guaranteed for 1 year.

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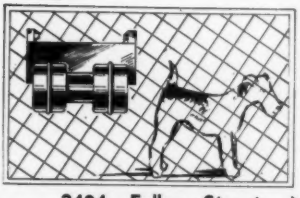
Twin 3" nozzles. Air output 2800 linear ft. per min. at normal room temps. 115 Volt, 60 cycle single-phase self-cooling AC operation. Finished in satin black enamel with silver screen.



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It is sponsored by the member companies of Associated Veterinary Laboratories through their educational bureau: the American Foundation for Animal Health. Remember these cooperating companies whose names are listed below.

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RESEARCH VETERINARIAN: Progressive manufacturer of feed medications and animal health products wants man as part of its expansion program to conduct therapeutic studies on diseases of animals. Advanced degree or some research experience preferred but not required. Address Box 565, care VETERINARY MEDICINE.

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SLIDES PREPARED: Histology microscope slides prepared for veterinary pathology and research. Ten years experience guarantees unsurpassed workmanship. Fast mail service. Write your needs. Bay Histology Service, 409 Roosevelt Way, San Francisco 14, California.

CLIPPER BLADES: Precision ground and sharpened like new. Avoid C.O.D. Enclose 75 cents each set. Professional Grinding Service, Lawndale Ext., Rt. 2, Box 558, Greensboro, North Carolina.

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DOG BOOKS: Write us. Just out new edition, Chihuahua and Boston, $4. each. Ready soon — Dog Encyclopedia. Training all breeds, $3. Judy Publishing Company, 2517 Michigan Blvd., Chicago 16, Illinois.

HORSE DRAWINGS: Colored horse drawing showing different sites of lamenesses, neurectomies, tenectomies; 17 x 21 in. Please send $2.50. Or will send C.O.D. Write Glen Carter, Iowa State College Veterinary Clinic, Ames, Iowa.

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Effective for animals of all sizes. From one to ten milliters of any liquid compound can be injected into an animal from distances up to approx. 50 yards.

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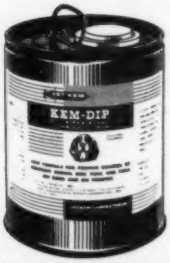
and Fleas

new flexible spout makes pouring easy . . .



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Distinguished Service Award

A Distinguished Service Award for outstanding contributions to the livestock industry of the State of Missouri was made to Mr. Raymond Lee Cuff, manager of the Southwest Region of the Livestock Conservation, Inc. He also has been active in local, state and national veterinary organizations, as well as numerous other groups, and is noted for his work on brucellosis, tuberculosis, and the prevention of shipping damage losses.

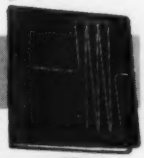
Scott Heads Merck Division

Clifford A. Scott will become region sales manager for the new Northwest Region to be established by the agricultural products division of Merck & Company, Chemical Division, March 1.

Mr. Scott, whose headquarters will be in Minneapolis, Minn., will supervise Merck animal health and feed products sales in Minnesota, Iowa, North Dakota, South Dakota, Nebraska, and a portion of Wisconsin.

SPECIAL INTRODUCTORY OFFER

to veterinarians just starting in practice!



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The pinkeye medicine of choice among leading veterinarians around the world. Order from your favorite veterinary distributor.

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CURTS **MULTI-SCOUR** CURTS

"Junior" Bol-Tabs

— 5 active ingredients with 5-way action in treating calf scours —

Phthalylsulfacetamide	20 gr.	Inhibits infection
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Tannins (extracted)	20 gr.	Coagulant
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Distinctive formula—size—shape—color—Available only from the Veterinarian—Your client will return to you for scour medication.

Enthusiastically used—recommended—dispensed by Veterinarians throughout the country. **MULTI-SCOUR** is a money-maker for the clinical practitioner.

Suggested dose: To each 150 pounds body weight—4 or 5 bol-tabs the first day and 2 or 3 the second day. Continue or repeat if or as necessary.

Package: Cartons of 100 and 500

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Sulfabrom is the first new development in sulfonamide therapy in over 20 years and the only long acting sufonamide available exclusively to veterinarians. Developed by Merck and Company, this new sulfonamide safely extends the effective therapeutic range to 48 hours following a single oral, intraperitoneal or intravenous administration. Quickly absorbed and slowly eliminated, Sulfabrom reduces the need for repeated handling of patients and makes possible complete recovery in some cases with a single administration. It is available in 15 gm. and 4 gm. boluses and a unique buffered powder for preparation of intravenous or intraperitoneal solutions or drenches. Write Merck and Co., Inc., Chemical Division, Veterinary section, Rahway, New Jersey.

A New Cotton Tipped Applicator Bag with autoclave indicator line which turns from pink to brown after sterilization is now available to the profession. The package

Glasco Products Company

saves time and eliminates doubts when applicators are stored for future use. For details ask Glasco Products Company, Owens-Illinois, Toledo, Ohio.

Furadantin Ora-Bols (Eaton) designates a product for use in treating small animals for urinary tract infections and dogs for canine tracheobronchitis. Each Furadantin Ora-Bol provides Furadantin 50 mg. in a dextrose excipient whose pleasing taste encourages prompt acceptance. Small taper-shaped tablets permit easy administration and are readily retained. For dosage and availability, ask Eaton Laboratories, Norwich, New York.

A new vaccine for **Canine Distemper-Hepatitis** has been introduced for professional veterinary use. Called Cyvac (American Cyanamid) it is an improvement over existing bivalents for these two diseases capable of providing long lasting immunity with one injection. For more information, write American Cyanamid Company, 30 Rockefeller Plaza, New York 20, New York.

A Flexible Transparent Wound Covering that is sprayed from an aerosol container contains two non-systemic antibiotics, Neomycin and Tryothrican, and is now available to the profession. Both antibiotics are non-toxic and, in their topical applications, have not activated resistant strains. For information ask Schuco Industries, Inc., 75 Cliff Street, New York 38, New York.

The therapeutic use of **Distemperoid** seems to have taken a silghtly new twist. It is now suggested that 1 cc. in 3 or 4 cc. of distilled water administered intravenously is the preferred therapy when attempting to treat distemper.

Veterinarian of the Year

Dr. Thomas M. Eagle of Kansas City North, Missouri, was named Veterinarian of the Year 1959 by the Missouri Veterinary Medical Association. The presentation was made during the annual banquet concluding the association's convention in St. Louis.

Doctor Eagle has had a small animal practice in Parkville, Missouri, since 1947. He was graduated from Colorado State University in 1938. He is active in local, state and national veterinary organizations, the boy scouts and many civic organizations. His father and seven uncles were veterinarians, and he also has a brother, who is a veterinarian in Chicago.

Treatment for Diarrhea

Severe diarrhea may be treated symptomatically by instilling one to two pints of tannic acid solution (one tablespoon to one quart of water) into the rectum. This treatment may be repeated daily.—*Atlas Newsletter, Small Animal Digest.*

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Quick relief for Bone, Bursal or Tendon Lameness

Single Bottle.....$2.00
3 and 1 free.....5.00
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Specialists in
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Six conventional shape blades designed for a wide variety of surgical uses. Manufactured of the finest quality, high carbon Swedish steel, the blades are honed to extreme sharpness to reduce operative bleeding and trauma to soft tissue. Each blade locks easily and securely into a standard Beaver handle manufactured of solid nickel-silver and designed to be held with comfort even during the longest operations.

Precision workmanship insures long life for both blades and handle. Beaver surgical blades have been used for years for all types of animal surgery.

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Engineered special for the Veterinary Practitioner

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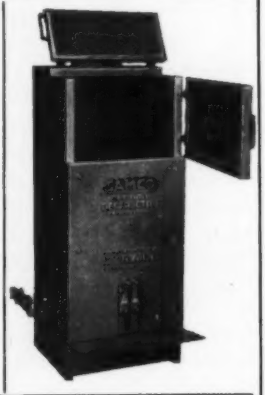

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Examinations

West Virginia

The West Virginia Veterinary Board will hold an examination for state license Monday, June 15, 1959, at the Capitol Building (Room 117), Charleston, West Virginia. For application form and information, write Dr. Harry J. Fallon, secretary-treasurer, 200 Fifth Street West, Huntington, West Virginia.

Ohio

The examination for state license to practice in Ohio will be conducted June 8, 9, 10, 1959 at Sisson Hall, College of Veterinary Medicine, Ohio State University, Columbus, Ohio. Applicants must be present at 8:00 a.m. on the first day. Applicants may secure application forms from the office of the executive secretary, Ohio Veterinary Medical Board, Room 720, Ohio Departments Building, Columbus 15, Ohio. All application forms must be returned to the secretary no later than May 4, 1959.

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TICK KILLER

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A neutral skin and fur cleaner. Contains no alkali, no soap. Rinses clean fast. Gives superior foaming, kills fleas in five minutes. Dilute with equal parts water for using or dispensing.
ACTIVE INGREDIENTS: Neutral cleaning and foaming agents, Hexachlorophene, Lanolin Esters, Piperonyl Butoxide, Pyrethrin.

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FLEA POWDER FOR DOGS • FLEA POWDER FOR CATS • TICK SALVE • FOAM CLEANER NEW AEROSOL PET SPRAY • TICK AND FLEA SPRAY • KENNEL DUST.

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new Panplex* and the D.V.M.

Once, there was this D.V.M. (a competent practitioner, but he had his problems). His patients hated him because when antibiotics were indicated, he'd pop four pills down their throats. Also, he had to rent a big office (which he couldn't afford) to store all the pills.

Then, he read an ad on Upjohn's new PANPLEX CAPSULES. It showed how Upjohn had squeezed four potent antibiotics into one economical capsule: *Panmycin*† for broad antibacterial action; *Albamycin*† to control resistant micrococci; *Nystatin* to suppress fungal overgrowth; and *Penicillin G. Potassium* for added impact.

So he ordered PANPLEX CAPSULES which he used with great success in numerous cases (see below) and he lived happily ever after.

PANPLEX CAPSULES are recommended in the treatment of the following conditions:

Dogs: respiratory—bronchitis, pharyngitis, pneumonia, tonsillitis, tracheobronchitis, and other upper respiratory infections; *urinary*—cystitis and nephritis; *dermal*—dermatoses and wounds; *miscellaneous*—osteomyelitis, bacterial complications of viral infections, and pre- and postoperative prophylaxis; *gastrointestinal*—bacterial diarrhea, enteritis, and gastroenteritis.

Cats: pneumonia, enteritis, abscesses, infected wounds, bacterial complications of viral diseases, and for pre- and postoperative prophylaxis.

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*TRADEMARK
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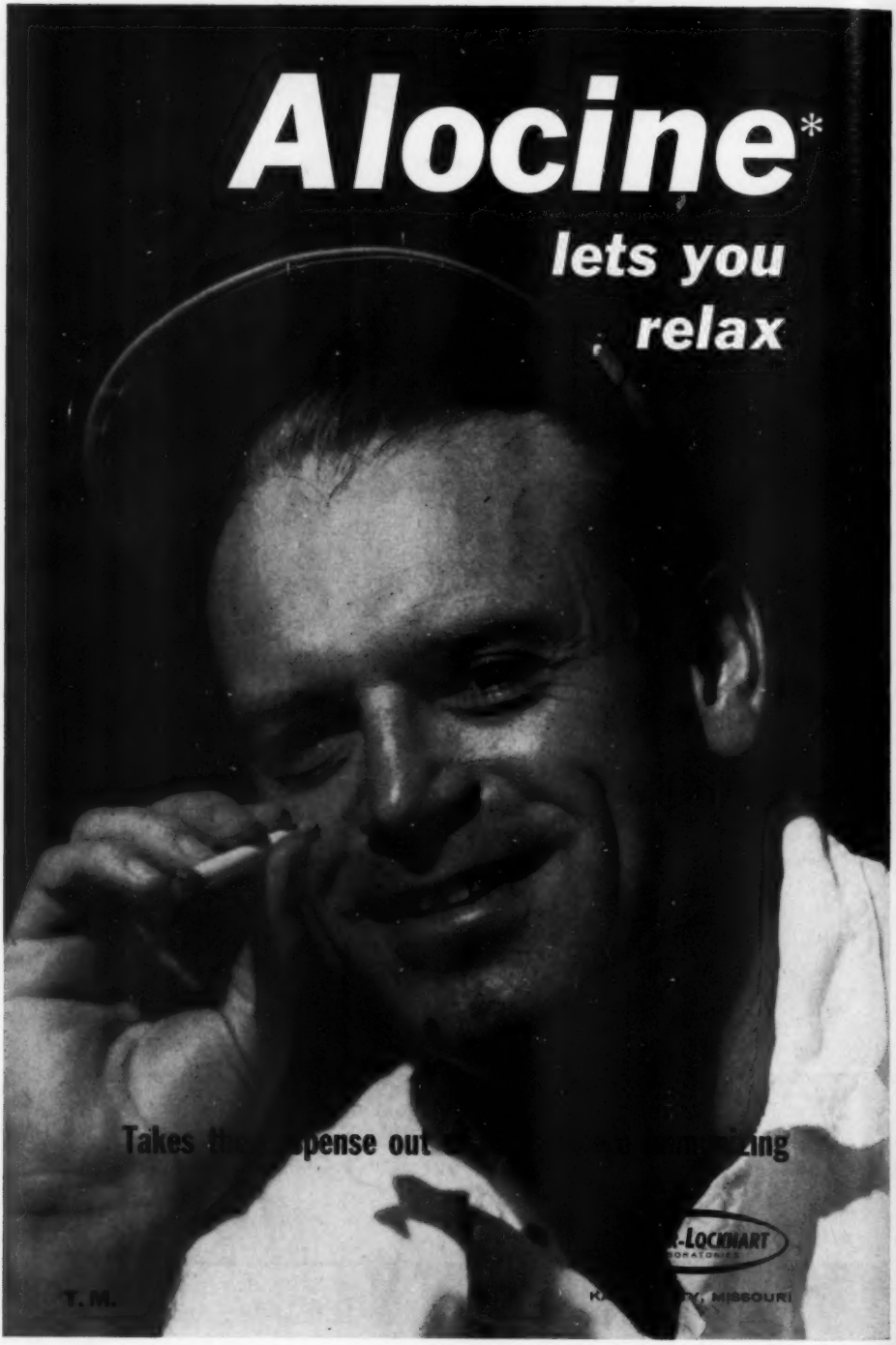
Veterinary Division / THE UPJOHN COMPANY / Kalamazoo, Michigan **Upjohn**


Alocine*
lets you
relax
T. M.

when

urinary

tract

infection

is suspected

FURADANTIN® ORA-BOLS™ veterinary

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new, exclusive veterinary dosage form

pleasant tasting ▪ easily administered ▪ readily retained

In small-animal urinary tract infections, FURADANTIN swiftly achieves high bactericidal concentrations in the urine, and in a high percentage of cases eliminates incontinence, dysuria, frequency, and straining. Of 32 dogs and cats recently treated,[1] 29 showed rapid clinical improvement. Often, there is marked improvement by the 4th day and complete recovery in 7 to 14 days.[2]

In canine tracheobronchitis, FURADANTIN given for 5 days stopped the coughing in 95% of 75 cases; in some dogs, complete symptomatic relief was gained in 48 hours.[3]

COMPOSITION:

Each FURADANTIN ORA-BOLS provides FURADANTIN 50 mg. in an excipient containing dextrose.

SUPPLIED:

Bottle of 100 scored 50 mg. ORA-BOLS. FURADANTIN also is available as: 10 mg. and 100 mg. scored tablets, bottles of 100, and Oral Suspension containing 5 mg. FURADANTIN per cc., bottle of 60 cc.

REFERENCES: 1. Mosier, J. E., and Coles, E. H.: Vet. Med. **53**:649 (Dec.) 1958. 2. Belloff, G. B.: Calif. Vet. **9**:27 (Sept.-Oct.) 1956. 3. Mosier, J. E.: Vet. Med. **52**:445 (Sept.) 1957.

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NITROFURANS—a *new* class of antimicrobials—neither antibiotics nor sulfonamides

ORA-BOLS™ is the Eaton trade mark for small, bolus-shaped tablets.

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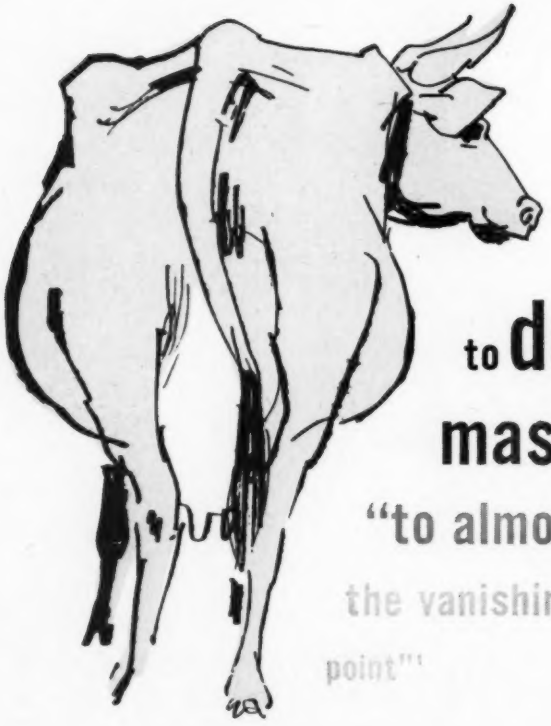

to decrease mastitis

"to almost the vanishing point"[1]

FURACIN®-PENICILLIN GEL *veterinary*

Furacin with penicillin produces an enhanced antibacterial action that is at least additive, and may be truly synergistic. The combination covers a broader bacterial spectrum of gram-positive and gram-negative organisms than either agent alone.

Indications: **For treatment of bovine mastitis caused by Staphylococcus aureus; Streptococcus agalactiae and dysgalactiae; Escherichia coli and Pseudomonas aeruginosa sensitive to Furacin.**

For use as a topical ointment in treatment of wounds, pyodermas, in otic and ophthalmic infections.

SUPPLIED: A crystalline suspension of Furacin 2% and procaine penicillin G (13,333 units per cc.) in peanut oil with aluminum stearate 3%. In rubber-capped vial of 100 cc.; applicator tube of 7.5 cc., box of 12.

1. Kakavas, J. C., et al.: J. Am. Vet. M. Ass. 119:203 (Sept.) 1951.

NITROFURANS—a *new* class of antimicrobials—neither antibiotics nor sulfonamides

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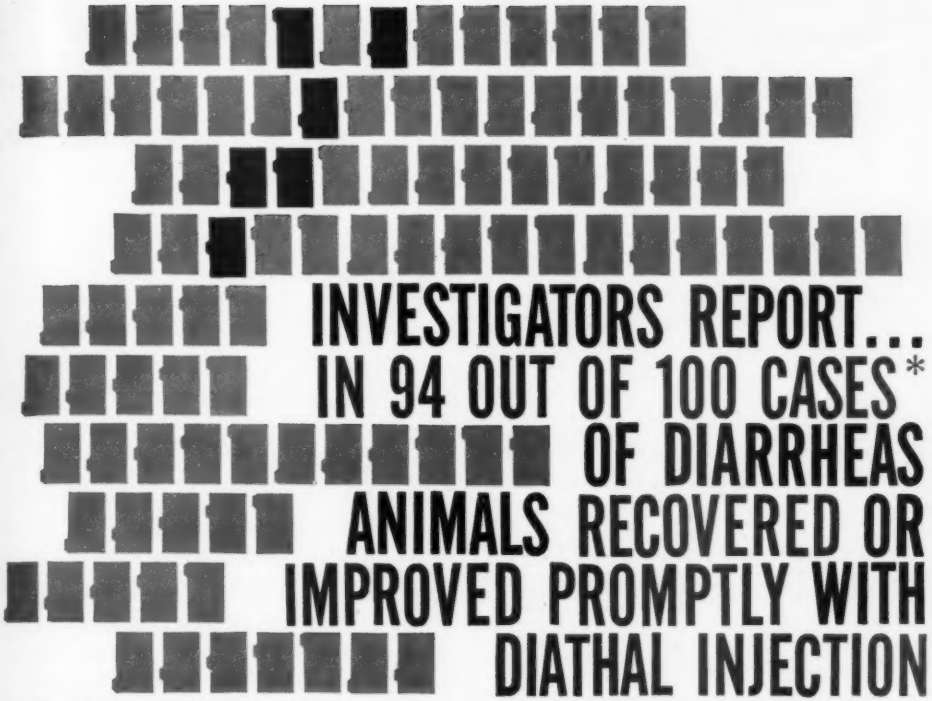

INVESTIGATORS REPORT... IN 94 OUT OF 100 CASES* OF DIARRHEAS ANIMALS RECOVERED OR IMPROVED PROMPTLY WITH DIATHAL INJECTION

a distinct advancement in the control of problem diarrheas

DIATHAL exerts a *suppressive action* on gut motility, provides wide-spectrum *antibacterial action* against enteric organisms and has the added *protective action* of controlling nausea and vomiting associated with virtually all diarrheas of cats, dogs and horses.

DIATHAL is indicated for intramuscular use *only* in dogs, cats and in horses not destined for human consumption.

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DIATHAL INJECTION

Schering

V-DL-J-129

*Good results in 226 of 236 cases reported to Clinical Research Division.

SULFA

. . . for a new

More than any other professional man, the practicing veterinarian knows that his most valuable asset is time. In any area of his practice, the success of his therapy cannot be measured by results alone; he is a busy man whose time must be used judiciously.

Well aware of this problem, Merck research workers have designed an antibacterial agent which, from its conception, was meant to satisfy the particular needs of the veterinarian. In cattle, this new drug produces effective therapeutic blood levels for at least two days, freeing the veterinarian from time-consuming return calls and minimizing stress-producing handling.

The most exciting development in sulfa therapy in 20 years

SULFABROM gives you all the benefits of sulfa efficacy and at the same time helps eliminate the necessity for frequent administration. Thus, SULFABROM is economical—your initial expenditure is sulfa-low and decreased total dosage brings cost down even lower.

SULFABROM, administered orally or

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ABROM*

new concept in sulfonamide therapy

SULFABROM is a bromine-substituted sulfamethazine developed by Merck research workers. This new antibacterial agent is the only sulfa product available *exclusively* to veterinarians.

intraperitoneally to cattle, produces effective blood levels lasting up to 48 hours—frequently long enough to eliminate *any* repetition of dosage.

SULFABROM—quickly absorbed, slowly excreted

Although SULFABROM is notable for producing effective levels in rapid time, once it has entered the blood stream its speed of action slows down considerably. SULFABROM is excreted very slowly; this accounts for its long-lasting effect. In cattle, detectable amounts may be present in the urine for as long as six days. Blood levels remain high, sometimes for as long as 53 to 60 hours. And, because it is excreted so slowly, seldom is the amount of SULFABROM passing through the urinary tract ever large enough to cause crystalluria.

SULFABROM—effective against a broad range of infection

By maintaining a high sulfonamide level in the tissues, SULFABROM minimizes the emergence of resistant strains of most pathogens. SULFABROM exerts its antibacterial effect at the cellular level long enough to combat effectively both gram-negative and gram-positive organisms including those responsible for:

calf diphtheria "recovery in 48 hours";
acute septic mastitis "uneventful recovery";
metritis "back on feed and eating normally" in two days;
foot rot "in 48 hours the cow was able to stand and started to eat";
pneumonia "in five days' time this calf was back to normal";[1]
as well as *scours*, winter dysentery, coccidiosis, shipping fever, listerellosis and miscellaneous infectious conditions, such as peritonitis and infected wounds.

SULFABROM—single-dose sulfa therapy available exclusively to veterinarians

In sum, SULFABROM represents the very latest advance in sulfa therapy. Effective against a full range of infectious diseases, economical to use by any standards, SULFABROM is your answer to the pressing problem of repeat calls and handling time in the treatment of almost any infection.

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DOSAGE *(in cattle)*

SULFABROM Boluses
60-90 mg. (1.0-1.5 grains)/lb. of body weight, orally—for *sustained* levels

SULFABROM Buffered Powder
15-30 mg. (0.25-0.5 grains)/lb., intravenously—for *immediate* levels
30-60 mg. (0.5-1.0 grains)/lb., intraperitoneally—for *rapid, sustained* levels
60-90 mg. (1.0-1.5 grains)/lb., orally, as a drench—for *convenient* levels

Supplied as
SULFABROM Buffered Powder—1-lb. bottles
SULFABROM 15 Gm. Boluses—packages of 5 and 50
SULFABROM 4 Gm. Boluses—packages of 5 and 50

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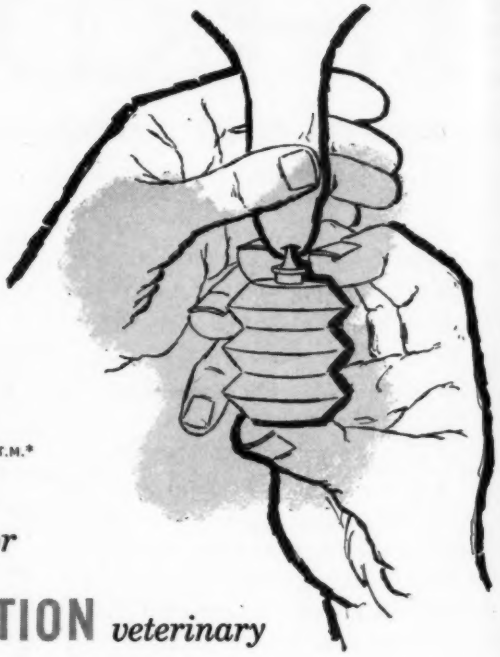

for **MASTITIS** *of*

dry and lactating cows

NEW SQUEEJET[T.M.]*

single-dose dispenser for

FURACIN® **SOLUTION** *veterinary*

brand of nitrofurazone

- delivers one full dose
- is discarded after using
- saves time
- is convenient, especially when a number of cows are to be treated
- unique package

*design patented

FURACIN has been shown to be strikingly effective in controlling mastitis under field conditions.[1,2] Of 7,123 lactating cows with acute mastitis, fair to excellent results were obtained in 5,597 (78%). Of 3,418 dry cows which had had mastitis during their previous lactating period, fair to excellent results were obtained in 3,104 (90%).

SUPPLIED A water-miscible liquid of FURACIN 0.2% in polyethylene glycol and water. Single-dose SQUEEJET disposable dispenser of 30 cc. Still available, bottles of 500 cc. with rubber stopper and 1 gal.

1. Mires, M. H., and Chadwick, R. H.: Vet. News 10:3 (Jan.-Feb.) 1947. 2. Mires, M. H.: J. Am. Vet. M. Ass. 117:49 (July) 1950.

All Eaton Veterinary Specialties Are Available Through Your Professional Veterinary Distributor.

NITROFURANS—a *new* class of antimicrobials— neither antibiotics nor sulfonamides

EATON LABORATORIES, NORWICH, NEW YORK

Veterinary Calendar

Apr. 7. **American Veterinary Radiology Society,** semi-annual meeting. Nassau Tavern, Princeton, New Jersey. Dr. J. J. Fishler, 3421 S. main, Elkhart, Indiana.

Apr. 13-14. **Oklahoma Conference for Veterinarians,** College of Veterinary Medicine, Oklahoma State University, Veterinary Medical Center. Dr. John H. Venable, chairman.

Apr. 16. **Seminar on Handling and Treatment of Caged Birds.** Shoreham Hotel, Washington, D.C. Dr. Irving E. Altman, speaker.

May 2-3. **University of Florida,** second Florida Conference for Veterinarians. J. Hillis Miller Health Center, University of Florida, Gainesville, Florida. Dr. W. R. Pritchard, program chairman.

May 7-9. **American Animal Hospital Association.** Annual Meeting. Municipal Auditorium, Colorado Springs, Colorado. Dr. Wayne H. Riser, 5335 Touhy Avenue, Skokie, Illinois, executive secretary.

Jun. 4-5. **Texas A. & M.,** 12th annual Texas Conference for Veterinarians. College Station, Texas. Dr. R. D. Turk, conference chairman.

Jun. 9-11. **Montana Veterinary Medical Association,** annual meeting. Butte, Montana.

Jun. 14-15. **Wyoming Veterinary Medical Association,** annual meeting. Sheridan, Wyoming. Dr. J. F. Ryff, P.O. Box 960, Laramie, Wyoming, secretary.

Jun. 17-18. **Utah Veterinary Medical Association,** annual meeting. Provo, Utah.

Jun. 18-20. **Animal Reproduction Symposium.** University of Illinois, Urbana, Illinois. Dr. P. J. Dzuik, III Animal Genetics, University of Illinois, Assistant Professor of Animal Physiology.

Jun. 20-22. **Idaho Veterinary Medical Association,** annual meeting. Moscow, Idaho.

Jun. 23-25. **North Carolina Veterinary Medical Association.** Morehead Biltmore Hotel, Morehead City, North Carolina. Dr. J. T. Dixon, 3026 South Main Street, Winston-Salem, North Carolina, secretary-treasurer.

Jun. 23-25. **Maritime Veterinary Associations,** joint conference. Mount Allison University, Sackville, N. B. Dr. P. D. McKercher, Box 310, Sackville, N. B., general chairman.

Jul. 13-14. **Kentucky Veterinary Medical Association,** 48th Annual Convention. Sheraton-Seelbach Hotel, Louisville, Kentucky. Dr. L. S. Shirrell, 545 East Main, Frankfort, Kentucky, secretary.

Aug. 23-27. **American Veterinary Medical Association,** 96th annual meeting in conjunction with **Third Pan American Congress of Veterinary Medicine.** Municipal Auditorium, Kansas City, Missouri. Dr. H. E. Kingman Jr., 600 S. Michigan Avenue, Chicago, Illinois, executive-secretary.

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Cutting efficiency and maximum blade performance has always been the surgeon's first consideration when choosing a surgical blade. BARD-PARKER offers you a blade made with the same consideration in mind . . . a blade of carbon steel of course . . . so superior for fine cutting edges.

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infected eyes and ears respond rapidly to

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brand of nitrofurazone

Wide-spectrum, non-irritating nitrofuran in formulations especially adapted for the treatment of bacterial infections of the

eye

FURACIN
SOLUBLE POWDER VETERINARY

"FURACIN in its water-soluble base is completely soluble in body fluids. These properties make it ideally suited for the treatment of ophthalmitis and postoperative therapy."*

FURACIN Soluble Powder Veterinary is conveniently applied directly from the plastic puff-bottle.

These FURACIN products contain FURACIN 0.2% in water-miscible vehicles. Therefore, they may be left in wounds to be sutured.

Order plastic "puff" bottle of 10 Gm.
Available through your professional veterinary distributor.

ear

FURACIN
EAR SOLUTION VETERINARY

This anhydrous, water-soluble dosage form of FURACIN affords prompt relief of otic infections in small animals.

In canine otitis externa, poor drainage, plus the trauma of scratching and rubbing, often frustrates therapy. It is noteworthy that "FURACIN has been used successfully in this condition . . ."*

In cases of otitis in which exudate is present, you will find the drying effect of FURACIN Soluble Powder Veterinary to be most beneficial.

Available in dropper bottle of 1 fl.oz.

*Belloff, G. B.: Calif. Vet. 9:16 (Nov.-Dec.) 1956.

NITROFURANS — a new class of antimicrobials—neither antibiotics nor sulfonamides

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Now...
cerebral depression
for 20-90 minutes
depending on
the agent you choose
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Various veterinary surgical procedures very often call for individualized anesthesia, and Abbott Laboratories offers full anesthetic selectivity with these three agents: PENTOTHAL for ultra-short-acting anesthesia . . . NEMBUTAL for short-acting surgical depression . . . and COMBUTHAL for intermediate duration. With any one of the three—

Onset of action is prompt . . . surgical hypnosis being achieved in just 3 to 5 minutes, from a single intravenous dose.

Degree of cerebral depression and duration of anesthesia are easily controlled, depending on the dose and the specific agent you select.

Optimal skeletal muscle relaxation accompanies anesthesia, facilitates uninterrupted surgery; a second dose is rarely needed.

Side effects are minimal with these agents, and there is little danger of cumulative effect. Patients awaken quickly, to a quiet, uncomplicated postoperative period.

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Denlinger to Schering Post

The appointment of William H. Denlinger as veterinary sales promotion manager of Schering Corporation was announced recently. Mr. Denlinger received his B.S. from Dickinson College in 1951. After serving in the United States Air Force from August 1951, until June 1955, he joined Schering in August 1955 as a veterinary sales representative. A year later he was made veterinary sales promotion assistant.

Veterinarian of the Year

Dr. Anthony E. Bott was named Veterinarian of the Year by the Illinois State Veterinary Medical Association at its annual meeting in Chicago, February 17. Doctor Bott is a founder and president of Corn Belt Laboratories, Inc., of East St. Louis. He was honored for his professional and civic achievements by his colleagues.

Dr. Bott, a graduate of the Chicago Veterinary College with 20 honors, and a winner of the Quittman Award, is a past president of the Illinois-Missouri Veterinary Medical Association, and both the Greater St. Louis and the Illinois State Veterinary Medical Associations. He has also been elected honorary member of the Cuban, Chilean and Brazilian Veterinary Medical Associations.

The presentation naming Doctor Bott as Illinois Veterinarian of the Year was made by Dr. A. G. Misener on behalf of his state association.

Pennsylvania to Expand

The University of Pennsylvania's School of Veterinary Medicine is embarking on the most extensive physical development program in its 75 year history. Dr. Alfred H. Williams, chairman of the Trustees of the University, disclosed that the school intends to construct two new buildings at New Bolton Center, its 320-acre site in Chester County, and hopes, with the cooperation and assistance of the state, and certain foundations, that additional facilities can be erected in West Philadelphia in order to accommodate increasing enrollment and additional research facilities for an expanding faculty.

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CYVAC® Vaccine is an example. Constant re-evaluation of this relatively new distemper-hepatitis antigen has given the profession an immunizing agent that:

a. Has standardized high potency.
b. Literally "jumps" into suspension.
c. Can be used in pups during the post-weaning danger period for infection.
d. Stimulates a better, longer lasting immunity than killed or non-standardized vaccines.

Dosage: 2 cc. subcutaneously for all ages and breeds.

CYVAC® Brand of Combined Canine Distemper-Infectious Canine Hepatitis Vaccine

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SWEB®

Swine Erysipelas Bacterin

for immunization of healthy swine and turkeys

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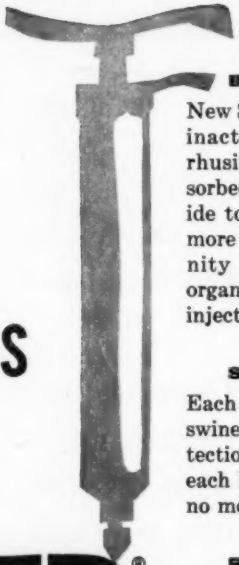


BUILDS SOLID IMMUNITY

New SWEB is a highly concentrated, chemically inactivated whole culture of Erysipelothrix rhusiopathiae. The killed organisms are adsorbed and concentrated with aluminum hydroxide to delay the release of antigens and assure more uniform absorption. Solid, strong immunity against five field strains of erysipelas organisms is developed 14 to 21 days after injection.

SWINE-TESTED FOR POTENCY

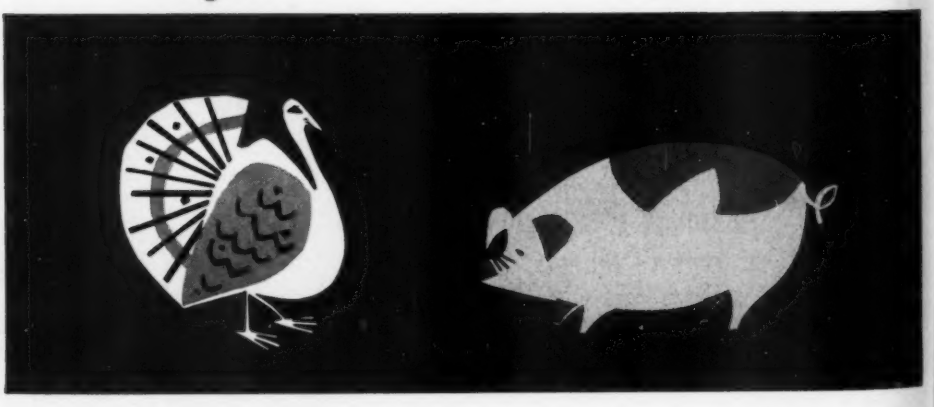
Each serial lot of SWEB is potency tested in swine before being released for sale. Proven protection for pigs is carefully demonstrated for each lot of bacterin produced. Yet SWEB costs no more than mouse-assayed bacterins.

REACTION RISK SMALL

New SWEB virtually eliminates the danger of vaccination setbacks, local or anaphylactoid reactions. Armour's culture methods dispense with the use of equine or other animal serums. Only porcine blood fractions are used. This unique process produces a bacterin that combines maximum concentration of antigens with minimum risk of serious side reactions.

NEW SAFETY AND CONVENIENCE

The organisms in SWEB are completely inactivated and cannot introduce erysipelas infection to clean premises. SWEB is supplied in 250 cc. bottles—sterile and ready for immediate use.



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Obesity

The proven effective dietary food in the management of weight reduction of mature dogs. Dispensed only by graduate veterinarians.

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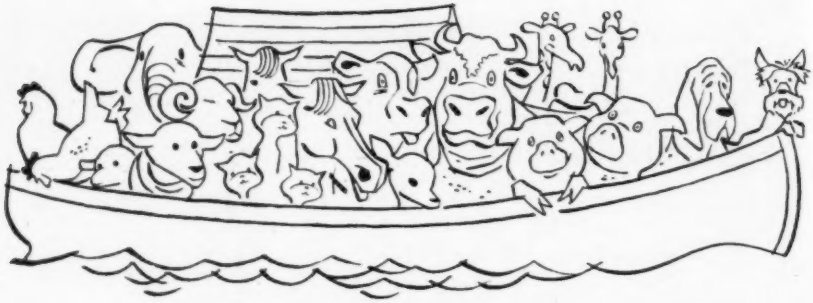

Rapid Bactericidal Action in All Species

The synergism of Neomycin and Polymyxin B extends the bacteri*cidal* action well beyond the limits of either antibiotic. The broad spectrum of effectiveness has been reported authoritatively in numerous published clinical studies.[1,2,3]

Because Daribiotic is bacteri*cidal*, resistant organisms have little opportunity to develop. Convenient dosage forms for the treatment of small and large animals broaden the usefulness of Daribiotic.

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NEOMYCIN-POLYMYXIN B*

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DARIBIOTIC Injectable—for prompt treatment of bacterial infections.
DARIBIOTIC Mastitis Infusion—in 7.5-cc. tubes and 100-cc. vials.
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DARIBIOTIC Tablets—for control of intestinal infections.
DARIBIOTIC Soluble—convenient oral administration in liquids for intestinal infections.

*U.S. Patent No. 2,565,057

1. Barr, F.S., Carman, P.E. and Harris, J.R.: Synergism and Antagonism in Antibiotic Combinations; Antibiotics and Chemotherapy; 4:818 (1954).
2. Baker, W.L.: Clinical Use of Injectable Neomycin and Polymyxin B; Veterinary Medicine, 53 (1959): 275.
3. Barr, F.S., Harris, J.R. and Carman, P.E.: Intramuscular Treatment of Staphylococcic Mastitis with Neomycin Sulfate and Polymyxin B Sulfate; J.A.V.M.A., 132 (1958): 110.

Write for literature and reprints

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Outstanding effectiveness in the routine treatment of CANINE DIARRHEA

FURADEX® ORA-BOLS™ veterinary

Complete remissions in 37 of 38 dogs[1]

FURADEX "... shortened the duration of diarrhea in comparison with previously used drugs, and in most cases produced an apparent complete recovery . . . (The diarrhea) generally ceased in 2 to 7 days without any side effect due to medication."[2]

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SUPPLIED: 50 mg. scored ORA-BOLS, bottle of 100.

REFERENCES: 1. Pollock, S.: Control of Nonspecific and Specific Enteritis in the Dog; read at the First Regional Conference on the Nitrofurans in Veterinary Medicine, Wilmington, Delaware (June 5, 1958). 2. Fisher, G. W.: Oral Use of Furadex in Canine Diarrhea, N. A. Vet. **39**:133-134 (Mar. 15) 1958.

ORA-BOLS™ is the Eaton trade mark for small bolus-shaped tablets.

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Now "capsule shy" pets can worm themselves with tasty CANDIZINE Tablets

(pet candy with piperazine)

Clients dread wrestling their pets to take capsules. So for pets with large roundworms, dispense palatable CANDIZINE Tablets and let the dog or cat worm itself.

Utilizing a tasteless grade of piperazine phosphate in a base of blended food and flavor ingredients, CANDIZINE is readily eaten by most small animal patients —either in tablet form or crushed and mixed with the feed. And CANDIZINE requires no fasting, eliminating pre-treatment fuss and bother.

Each CANDIZINE tablet contains 384 mg. piperazine phosphate (equivalent to 161 mg. piperazine). Offer one tablet for each 8 lbs. body weight. Repeat in 10-14 days in severe infestations. Candizine is also indicated for certain zoo and fur-bearing animals.

Candizine supplied in attractive prescription vials: 20—5 tablet vials

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of DISTEMPER, INFLUENZA and other infectious diseases

Omnadin is not merely a foreign protein. It also contains lipoids which contribute materially to its action.

In acute febrile infectious diseases of domestic animals such as pneumonia, pleurisy, gastro-enteritis, metritis, mastitis and sepsis, response to Omnadin is usually favorable.

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Recommended as an adjunct in the treatment of MASTITIS in cattle.

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